Survey: Half of DP Departments Understaffed

By Marguerite Zientara
CW Staff

A majority of DP managers are operating below their optimum staff levels, according to a *Computerworld* mail survey sent out to 500 managers around the U.S.

The survey went out to managers from CW's subscription list representing all areas of the country, all sizes of installations and more than a dozen industries.

Of the 313 respondents (62.6%) to the survey, 177 (56.5%) indicated they were operating below their optimum staffing levels, while 131 (41.9%) said they were not operating below their preferred levels.

The results — representing such a high rate of return — may help resolve the current "DP turnover debate," with opposing experts arguing whether employee turnover is a myth or a serious impediment to productivity [CW, Feb. 23].

Of all the respondents — both those who indicated that they were and those who

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

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'Eagle' Flies

Computerworld begins a special two-part series this week, drawn from a new book entitled *The Soul of a New Machine* by Tracy Kidder.

The book chronicles the development of Data General Corp.'s 32-bit supermini, the Eclipse MV/8000, code-named "The Eagle." Manager Tom West and his two teams, "The Hardy Boys" and "The Microkids," faced competition from both within and without in attempting to bring the Eagle in on schedule.

DG's new Raleigh, N.C., facility was *supposed* to be working on the supermini, but was reportedly having problems. On the other hand, Digital was selling the VAX-11/780 like crazy.

West put together a team of young and energetic, but inexperienced engineers, an architect in cowboy boots and a programmer who could only write microcode on his back porch to make the Eagle fly. Their story is a compelling human adventure.

Kidder, an author and journalist, spent more than two and one-half years with the DG project team to write this major contribution to computer technology literature.

Part 1 of *The Soul of a New Machine* — and an interview with Kidder — appears in the In Depth section of this week's issue. Part 2 appears next week. The book is scheduled for publication Aug. 26.

In-House Systems Most Affected

Tax Plan to Force Software Rewrites

By Lois Paul
CW Staff

If your DP shop is toying with the idea of switching from an in-house financial management system to a software house-supplied package, the new federal tax legislation may prove to be the deciding factor.

Major vendors of financial management software packages report they are preparing substantial changes to their systems to comply with the recent revisions.

A big question is whether the average DP manager faced with incorporating some of these new regulations to prepare 1981 tax returns is aware of the extent of the changes required.

The most severely affected will likely be the DP shop that is using an in-house system that may require complete rewriting to encompass the new tax regulations.

Based on a study conducted by Focus Research, Inc. in West Hartford, Conn., this represents nearly half of the large IBM shops. As of the first quarter of 1981, 45% of IBM mainframe installations had in-house financial management systems; 41% did not have automated systems; and 14% had financial management software packages.

A major feature of the tax revision involves substantially faster depreciation write-offs for business. The complicated useful-life depreciation schedule is replaced with four basic categories: three years for most vehicles, five years for most equipment, 10 years for certain public utility property and 15 years for most depreciable real estate and some long-lived public utility property.

(Continued on Page 5)

IBM's Personal Computer Paves New Corporate Path

By Tom Henkel
CW Staff

NEW YORK — The giant of the computer industry is thinking small.

IBM last week announced its smallest system to date, a personal computer. In addition, the firm announced an untraditional marketing agreement with Sears, Roebuck and Co. and Computerland as distributors of the system, and the firm proclaimed it is looking to buy programs from anyone who will listen to it.

Priced to compete with longtime personal computer vendors like Apple Computer, Inc., Radio Shack Corp. and Commodore, Inc., IBM's entry into the personal market, called the IBM Personal Computer, costs between $1,565 and roughly $2,100. It offers 16K- to 256K bytes of main memory, 40K bytes of read-only memory (ROM), up to 320K bytes of diskette storage and printing speeds of up to 80 char./sec.

IBM announced a DOS-oriented operating system for the processor and it also announced a contractual agreement with Digital Research,

(Continued on Page 4)

Demand for DPers Up, Training Dollars Down

By Ann Dooley
CW Staff

BETHESDA, Md. — The demand for DPers is snowballing, the work load is swelling — and the number of corporate dollars earmarked for DP training is declining.

As a result, the growth rate of DP training has decreased during each of the past three years.

According to some gloomy statistics culled from a survey of 307 DP training managers in organizations of various sizes in the U.S. and Canada, the funds allotted to DP training amounted to only 1.3% of the average DP budget in 1980. What's more, only 58% of the training administrators expected to see some kind of budget growth. In 1979, 70% said they expected budget growth.

On a brighter note, however, 91% of those surveyed told the pollster — Brandon Systems Institute, Inc. (BSI), a training consultant firm — that their training budgets kept up with or exceeded the inflation rate in 1980.

Although DP budgets climbed approximately 25% to an average $15.4 million, the survey found training budgets grew only 15%. Systems programmers received the largest portion of the training dollar, followed by applications programmers, applications systems and design analysts, DP managers, staff and support and, at the low end, operations and data entry personnel.

On a per-person basis, expenditures increased by 14% in 1980, but this

(Continued on Page 6)

AT&T Judge Eyes DOD Study

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — The Defense Department's chief attorney indicated at the AT&T antitrust trial last Thursday that a Defense Communications Agency (DCA) study opposing breakup of the Bell system should not have been given to AT&T.

Bell has introduced the document as part of its defense against the gov-

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AT&T Judge Eyes DOD Evidence

(Continued from Page 1)

ernment's antitrust charges. Coming from an ostensibly neutral and authoritative source, the document could lend great weight to the phone company's argument that divestiture will jeopardize the nation's security.

The key question, however, is whether the agency is neutral, and closely related to it is whether the conclusions are sound. A former government official, who studied the relationship between the present structure of the telephone industry and national security, said the conclusions are "seriously biased."

DCA General Counsel John Whealen was the first witness to take the stand Thursday; he was followed by Department of Defense (DOD) General Counsel William H. Taft IV. Whealen co-authored the report with DCA Regulatory Counsel J. Randolph McPherson.

Taft, when asked by presiding Judge Harold H. Greene whether it was "appropriate" for Whealen to give AT&T a copy of the report, said, "I would not have done it."

Whealen, responding to questions asked mostly by Judge Greene, revealed DCA asked to be briefed by AT&T and the U.S Independent Telephone Association (Usita), but not by Bell's competitors, before the report was writtten.

DOD's preference for dealing with the integrated Bell network and its desire to end the antitrust suit were well known to the study's authors. Whealen set up the AT&T briefings and sent the final copy of the study to the phone company without telling the Justice Department, even though this may be a violation of the U.S. legal code, which Whealen said he is familiar with.

Judge Greene began wondering about the antecedents of the DCA analysis when it was introduced by AT&T on Aug. 4, and after the Justice Department's chief counsel, Gerald Connell, advised him of "reports indicating that this particular document may have been the product of a joint effort of the Department of Defense and AT&T."

AT&T's chief trial attorney, George L. Saunders Jr., vigorously denied the reports, but Judge Greene was not convinced. Greene emphasized that he was not implying improper behavior on AT&T's part; rather, he is concerned about the appropriateness of DOD's condoct.

DCA's major conclusion is that "divestiture as currently proposed by the Justice Department (i.e. separation of local exchange from intercity functions) would cause substantial harm to national defense ... and emergency preparedness telecommunications capability." Divestiture would "substantially reduce ... the incentives or the ability of Bell operating companies, AT&T Long Lines and the independent telephone companies to engage in ... prior joint planning ... to provide national emergency ... communications."

Major Contention

One of the DCA study's major contentions is that the Justice Department does not understand how DOD uses the nationwide telecommunications network — specifically, it does not appreciate that "Defense ... utilizes the network, meaning all of it, irrespective of who owns any particular portion." If service fails in a particular area, "centralized network management permits ... rerouting ... over other circuits in other company areas. Integrated network planning and design, operation and management and revenue sharing are all necessary elements to this result ... It is totally unrealistic to assume that two or more companies would commit themselves, voluntarily and with little if any motivation, to unrestricted support of one or more other companies in such areas as loan of people, assets and technical support in time of disaster or emergency."

Our source agreed that it would be easier for DOD to rely on the present centralized network management structure. "But that's because the structure is already in place and operating," he said. "It isn't necessarily the only solution to the problem or the best one."

He pointed out that specialized carriers, particularly those providing satellite services, are not a part of the AT&T-directed planning/management structure, "and in a national emergency, satellite circuits would be particularly valuable." As to the alleged difficulties of getting competing companies to cooperate in providing emergency services, "the Department of Defense, itself, has described how this can be done," said our source. He was alluding to what Lt. Gen. William J. Hilsman told the Senate Commerce Committee last June, during consideration of S. 898, the pending Communications Act rewrite bill. Hilsman is the director of the DCA, the organization that issued the study in the AT&T antitrust case.

The gist of Hilsman's testimony was that "there must be specific legislative safeguards requiring all telecommunications carriers to engage in network planning and management, to develop plans and procedures for protection and restoration of essential telecommunications and to prepare for interconnection and interoperation of facilities and services when necessary to meet the national defense or emergency preparedness needs." Specific language embodying this recommendation was later submitted to the committee and incorporated in the bill.

Asked whether he thooght AT&T helped write the DOD analysis, our source said, "I'm no longer in a position to judge that one, but the conclusions sound suspiciously similar to those in a study which Stanford Research Institute (SRI) did for AT&T earlier this year."

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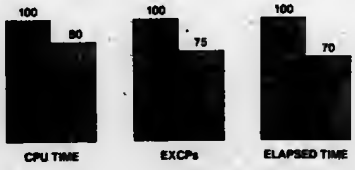

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Personal Computer Paves New Path for IBM

(Continued from Page 1)

to provide the commonly used CP/M-86 operating system.

IBM has also contracted with Personal Software, Inc. and Information Unlimited Software, Inc. to provide the Visicalc problem-solving package and the Easywriter word processing package on the processor.

Like other personal computers, the IBM processor offers color graphics capabilities that provide users with a text system capable of displaying 256 characters in any of 16 foreground and eight background colors. It is also capable of displaying graphics in four different colors.

IBM's Personal Computer marks two major firsts for the firm. It is the first time IBM has developed a processor not exclusively aimed at a business audience and it is the first time IBM has made a serious attempt to sell its products outside its internal sales structure.

IBM said the personal computers will be available in October in Sears Business Machine Stores and the nationally known Computerland outlets. The processors will also be sold in IBM's retail outlets and through a special sales unit of the firm's Data Processing Division, according to C.B. Rodgers, vice-president and group executive of the firm's general business group.

	IBM	Radio Shack TRS-80 S	Radio Shack TRS-80-III	Xerox 820	Commodore Inc. Pet	Apple Inc. Apple II
Minimum Configuration	16K Cassette B&W Monitor	4K Cassette B&W Monitor	48K 2 Diskette B&W Monitor	64K 2 Diskette B&W Monitor	32K Printer 1 Diskette B&W Monitor	48K 2 Diskette B&W Monitor
Minimum Configuration Price[1]	1,565	$399	$700	$2,995	$2,000	$3,620
Memory Range	16K-256K	4K-64K	4K-64K	16K-64K	4K-32K	32K-64K
Standard Configuration Price[2]	$4,425	$4,727	$3,972	$5,089	$2,900	$2,920
Maximum Number Of Disk Drives	2	4	4	2	8	8
Operating System	DOS CP/M-86 USCD P-System	TRS-DOS	TRS-DOS	CP/M	Pet	DOS
Languages	Basic Pascal	Cobol Fortran Basic	Cobol Fortran Basic	Basic	Basic	Basic Pascal Fortran
Visicalc Support?	Yes	Yes	Yes	Yes	Yes	Yes
Word Processing Support?	Yes	Yes	Yes	Yes	Yes	Yes

Source: IBM and The Yankee Group

1 Purchase price for a minimum workable configuration
2 Purchase prices based on retail prices in the Boston area The standard configuration includes an operating system, 64K-byte processor, two diskette units, one printer and a black-and-white display unit

Representative Sample of Personal Computers

It is also the first time IBM has offered a processor where virtually none of the operating software or applications were developed by IBM. The DOS operating system was developed for IBM by Microsoft, Inc., the developers of the primary programming language for the system, Microsoft Basic. A Pascal compiler is also available, according to IBM.

There are three accounting packages — accounts receivable, accounts payable and general ledger — all developed by Management Science America, Inc.'s Peachtree Software, Inc. — and another IBM first — Microsoft Adventure — a Dungeons and Dragons-type computer game.

Apparently in a move to dredge up applications software for the processor, IBM has also gone into the third-party software business with the Personal Computer Software Publishing Department.

The publishing department will accept for review programs created by just about anyone, from the guy on the street to IBM programmers. The programs will be evaluated by IBM and, if approved, offered to IBM Personal Computer users with a royalty going to the developer.

One of the conditions of the publishing company is that the developer must be able to support and, if necessary, update his program. IBM's director, Entry Business Systems' P.D. Estridge, said a similar agreement has been reached with other third-party firms providing software for the Personal Computer.

System Features

The system operates on a standard 120V current and does not require any special cooling facilities. It is based on a 16-bit Intel Corp. 8088 microprocessor and can make use of a standard black-and-white or color television or, as in the case of the IBM press demonstration here last week, a wide-screen television.

The processor can communicate over asynchronous lines with a standard RS-232C adapter to access other processors, laboratory instruments and data bases like Dow Jones Co. Retrieval and Source Telecomputing Corp.'s The Source.

Throughout the DP division marketing arm, IBM is offering volume discounts of 5% for 20 to 49 orders, 10% for 49 to 150 processors and 15% for more than 150 orders. Discounts are also available to educational organizations, IBM said.

The processor will be manufactured in the firm's Boca Raton, Fla., assembly plant. However, the CRT portion of the processor is being manufactured in Taiwan by an unspecified vendor.

A basic system with 16K bytes of main memory attached to an audio tape player and television set costs approximately $1,565. A typical 64K byte system with a single diskette and display costs $3,005. An expanded system for business with full-color graphics capabilities (limited graphics capabilities are available on smaller systems), two diskette drives and a printer costs about $4,500. Systems come with both software and hardware operator's manuals.

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MSA First On Bandwagon

ATLANTA — The day after IBM announced its Personal Computer system, Management Science America, Inc. (MSA) unveiled accounting software packages designed for the new microcomputer by its Peachtree Software subsidiary.

Developed by Peachtree under a contract with IBM, the software includes general ledger, accounts payable and accounts receivable packages, MSA explained.

The project involved adaptation of existing Peachtree Series 5 software to the Intel Corp. 8088 microprocessor environment, as well as enhancements, the vendor said.

The software is written in interpretive Basic and makes use of Peachtree's Visionary screen management system, which previously only was available with Peachtree's Cobol packages.

The Visionary component reportedly will enable users to see the whole form on the screen, rather than having to respond to one-line prompts with required information and only seeing the completed form when it is finished.

Peachtree Software, which was acquired by MSA in June, is located in Suite 700, 3 Corporate Square, Atlanta, Ga. 30329.

Reagan Tax Plan to Force Software Rewrites

Vendors Gearing For Tax Change

By Lois Paul
CW Staff

Major vendors of financial management software packages are gearing up for substantial changes to their respective offerings to comply with new federal tax regulations.

At the same time, they report an increased interest in purchase of their packages that involve fixed asset components.

Tony Yager of McCormack & Dodge Corp.'s fixed asset group said his company already has been able to respond to some of the new ideas, such as the investment tax credit portion. "That already is generally built into our system and requires no modification at all," he said.

The required changes to GL/Plus will be fewer than those necessary for an in-house system, Yager said.

"They will have considerably more changes, considering they are geared toward one or two regulations. These are not written as generally as a software system such as ours is," he added.

Yager speculated the people who have been buying the GL/Plus package during the last three years decided to switch to a package from an in-house system when the asset depreciation range (ADR) regulation came out.

Software International Corp.'s changes to its general ledger and financial reporting system should be fairly major, according to Frank Willett, fixed asset software manager.

"You are not only adding something," (what he called the 10-5-3 depreciation schedule) "but you also are taking out something else [ADR]," Willett explained.

Companies with in-house systems will face the same changes, Willett said, and it will take them days, weeks and months to implement the changes for their one system. Software International will be making changes once that will affect hundreds of systems.

John Nugent, an Eastern division marketing representive for Software International, said, "I have never had so many prospects and I've been with the company two years.

"Many firms have performed this fixed asset accounting task in a very archaic manner for so long, but the complexities of 10-5-3 may justify their bringing in a fixed asset package," he said.

"They have been patching their old homegrown system now for so long and it's just barely making it. With the complexity of 10-5-3, they'll need to really go to a software house to get the features and the capability they need," he added.

Larry Williams, fixed asset national product manager for Management Science America, Inc. (MSA), said his company plans to be in compliance with its general ledger system by the end of the year.

He said that in-house systems may be more rigid than a package such as MSA's and may therefore require an entire rewrite to comply with the new regulations. Another complication, according to Williams, may be conflicting state tax laws that companies will have to contend with.

(Continued from Page 1)

The general response among major financial management software vendors is that a thorough study of the final version of the tax legislation is the first step before changes will be made. All those contacted indicated changes to their packages would be made (see related story).

"The effect of the new laws is fundamentally to let you recover your investment in a shorter period of time," according to Elliott Kahn, manager of Coopers and Lybrand's engineering and evaluation group of its New York tax department.

For existing equipment that people own right now, there will be no changes in software or methods used for calculating taxes, Kahn said. However, if the company is expanding and buying new equipment, the existing depreciation schedules will not be valid.

"If you have a company that isn't going to be acquiring much property this year, for all I know they may elect to do it by hand, the old-fashioned way," Kahn said. He noted that the present law is going to contribute to three different programs for depreciation over the next three years. "So it will be increasing demands on in-house DP to do some considerable writing." Kahn's suggestion would be for a DP department to write a "universal program."

Jerry Neal, staff attorney for Dean Witter Reynolds in San Francisco, suggested that the impact of the tax revisions on a DP shop will be directly related to the sophistication of the software program being used there.

"If the company had the same level of competence in somebody on their staff that the major vendors do, then the impact would be the same," he said.

Companies with in-house financial management software may not have the personnel available to do the analysis of the tax law and rewrite their programs, he explained. Neal said his own efforts to digest the new tax law "makes me realize how much of a major task it is going to be to revamp computer schedules."

A major problem, he said, is that the changes have so many different effective dates, they are going to require continual updating of a software program not just each year, but also at various times during the year.

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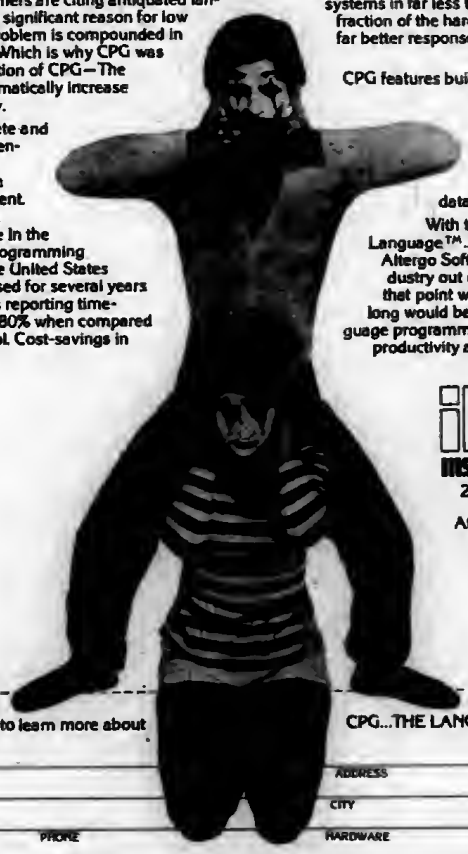

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Demand for DPers Up, Training Dollars Down

(Continued from Page 1)

figure does not account for the natural increases caused by inflation. Many respondents indicated they did not even have a formal budget for training procedures.

Top management was cited as the major stumbling block to increased training. Other weighty factors, according to the respondents were:

- Lack of management support.
- The inability to free employees from their work in order to offer them increased training.
- Scheduling and time problems.
- Budget constraints.
- A lack of quality courses and instructors.

Regardless of department size, the proportion of employees in various DP jobs was fairly constant, according to the results. DP managers and support personnel comprised 20% of the total DP staff, programming and analysis personnel accounted for 48% and operations and data entry employees amounted to 32%, the survey showed.

The training provided to each function in the DP department varied, also. Ten or more days of training were offered only to programmers, with systems analysts accruing a little less. Management, staff and operations and data entry personnel received only six days of training per person, according to the survey results.

While the DP department largely sought outside training, as many as 78% of the respondents trained their company's user departments inhouse. Entry-level training was performed by 80% of the respondents, as well.

Those vendors that do not have formal budgets for training indicated that expenses came out of DP overhead (72%). Some of the larger organizationa used a system of charging back costs to user departments, however.

DP trainers rated direct mail brochures and DP training groups as the most important methods by which they receive information about training. The least important were found to be local DP associations and telephone, according to BSI.

Outside vendors teach courses inhouse at 74% of the respondents' installations. Similarly, 95% of the respondents send their employees to public vendor training courses.

BSI's "Annual DP Training Survey" is available for $25 from BSI at 4720 Montgomery Lane, Bethesda, Md. 20014.

Average People In:	Average Number of Days Per Individual Per Year 1980	1979	1978
DP Management	6.7	6.4	6.0
Staff & Support	6.1	7.0	Not Available
Systems Analysis & Design	8.9	6.0	10.7
Applications Programming	10.4	9.6	14.2
Systems (or Operating Systems) Programming	11.5	9.5	6.9
Operations & Data Entry	6.4	6.0	9.4

The Average Number of Days Spent on Formal Training According to Job Function.

Position Type	1980	1979	1978
DP Management	$ 900	$ 549	$889
Staff & Support	700	651	Not Available
Applications Systems Analysis & Design	1,000	722	472
Applications Programming	1,100	767	683
Systems (or Operating Systems) Programming	2,200	1,254	890
Operations and Data Entry	300	136	267
Average Per Person	640	598	518

The Average Dollar Amounts Spent on Training a DP Employee Relating to Job Function.

Function	$ Per Training Day 1980	1979
A. DP Management	$ 99	$ 86
B. Staff and Support	111	93
C. Applications Systems Analysis & Design	86	90
D. Applications Programming	104	62
E. Systems (or Operating Systems) Programming	149	126
F. Operations and Data Entry	38	23

The Average Dollar Amounts Spent Per Training Day According to Job Function.

Survey: DP Trainers Won't Stay

BETHESDA, Md. — DP training managers apparently do not remain in their positions very long.

While the job hopping rate in the DP industry is high, DP training managers seem to experience exceptionally high turnover, according to a recent survey by Brandon Systems Institute, Inc. Of those polled, 43% had been in their position for less than one year, and fewer than one in five had been in the same position for as long as four years.

But instead of moving from one company to the next, training personnel apparently move within a company, indicating they are either being trained for another post or are switching positions in DP. Only one in nine changed companies more than once in the past five years.

In accordance with this apparent deemphasis on training as a career, training managers earned a salary average of $27,200 in 1980, up 12% from 1979, or about even with the rate of inflation.

Besides holding a seemingly low position on the corporate ladder, training directors are also losing ground to other DP employee functions, most of which received higher earnings and percentage growth increases than the respondents on the average, according to BSI.

Only slightly more than 50% held full-time training positions; the survey showed, with the industry average appearing to be approximately one full-time trainer for each 100 DP employees.

Experience Key For DP Manager

By Brad Schultz
CW New York Bureau

What is the best way to prepare for a job as manager of DP?

Virtually all 14 of the DP managers *Computerworld* polled by telephone last week said that question was very difficult to answer. But nearly all gave the same answer: Come up from the ranks.

"Get an entry-level job and work like hell," advised Ray Daigle of Hasbro Industries in Pawtucket, R.I.

In Portland, Ore., Omark Industries' Norm Tucker also prescribed ascent "through the ranks with exposure to many kinds of users."

At White Stores, Inc. in Wichita Falls, Texas, Paul Gunderman identified three kinds of experience a DP manager should have. In order of importance, they were: systema design, operations and technical support.

At Ralph's Grocery in Compton, Calif., Terry Peets recommended that a person aspiring to the post of DP or MIS manager first work for a vendor in a capacity that entails exposure to the needs of many different users.

Most of the 14 DP managers told CW that technical background was more important than managerial background in the making of a DP manager.

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Academia Fails Test for DP Jobs

By Brad Schultz
CW New York Bureau

Academic programs in computing fail to adequately prepare people for DP jobs.

That was the consensus of 14 DP managers *Computerworld* interviewed by phone last week. The managers run DP for three insurance companies, two banks, two retailers, two manufacturers, a hospital, a hotel, a land developer, a publisher and a school district.

Some of the DP managers said trade schools outdo universities and colleges at producing people qualified for entry-level jobs as programmers. Academic computer science departments, they declared, yield people who want to write compilers and other systems software.

But many user organizations have that software already written, the DP managers told CW. Users can now buy the software as off-the-shelf packages.

Failed Expectations

The telephone survey indicated that DP managers and fresh computer science graduates, respectively, tend to have opposing sets of failed expectations. The managers want to hire people willing and able to handle mundane commercial applications. They expect universities and colleges to supply such people, but the institutions do not.

Computer science graduates, on the other hand, are trained in a theoretical and experimental discipline, about as relevant to DP as architecture is to carpentry. Soon after the ink dries on their baccalaureate diplomas, these devotees of Pascal and Lisp expect users to provide them with esoteric projects in systems development. But the users, devotees of Cobol, do not.

"Most universities teach computer science, not [management information systems]. They stress compiler writing, but not applications development," according to Systems Manager Rene Fowler at the Louisiana Land and Exploration Co. in New Orleans.

That view was seconded in Vermont and elsewhere. But in Berkeley, Calif., Kaiser Health Plan's John O'Grady said, "Things are much better than they were." Universities are making computing curricula "more relevant to the real world," the data center director asserted. In fact, CW turned up evidence that many DP managers regularly help local schools put more of the "real world" in computing classrooms.

Richard Barnhart, systems vice-president at the National Bank of Alaska, sits on a board that advises the University of Alaska and community colleges around Anchorage on how to teach DP. O'Grady pointed to similiar cooperation between the University of California at Berkeley and local DP managers. The University of Houston does likewise.

Despite such assistance from the user community, "most universities are way behind in technology — years behind users in techniques for systems design," acording to Paul Gundermann, who runs DP at White Stores, Inc. in Wichita Falls, Texas.

DP Managers Turn to In-House Training

By Brad Schultz
CW New York Bureau

Many DP managers rely on in-house training to fill gaps between what academicians teach computing students and what the managers believe new hires should know.

That was indicated by the 14 DP managers *Computerworld* polled last week. However, some users lack resources for in-house training, so they send personnel to professional seminars and buy audio-visual instruction packages.

Most of the polled managers said their organizations provide in-house training. But the National Bank of Alaska's Richard Barnhart said he was "not proud" of having to compensate for the weaknesses of educational institutions.

Several managers recommended that universities and colleges establish advisory boards of local DP managers, who would recommend changes in the curriculum associated with DP on an annual basis.

No One Is Happy

No one seems very happy with the general state of computing education in the U.S. Academic computer science departments face a staggering shortage of qualified faculty while computing class enrollments soar.

To solve this problem, computer scientists have sought financial support from a federal government that is slashing aid to education [CW, July 27]. As many computer scientists migrate from universities to industrial research centers for higher salaries and superior facilities, those who remain on faculties find it more difficult to teach computer science.

Meanwhile, DP managers want universities and colleges to teach DP. In the CW survey, several respondents acknowledged the value of computer science to progress in basic technology; a few said DP studies should be taught in business schools rather than computer science departments.

Many computer scientists, who typically have little interest in DP, endorse such separation.

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Half of All DP Departments Understaffed

(Continued from Page 1)

said they were not operating below optimum staff levels — the majority felt that turnover had a "troublesome" effect on their overall DP operations.

The majority of those operating below staff felt the problem also had a "troublesome" effect on their company's overall operations, while most of those functioning at normal levels said the impact on the company was "insignificant."

Only a handful felt that the impact on either the DP operations or the company's operations was "serious," although a fifth of those operating below top staff levels felt the impact on the overall DP operations was "serious."

As the accompanying chart illustrates, of the 177 operating below their best levels, 80 lost up to 10% of their workers in the last year, while 49 lost 10% to 20%, 29 lost 20% to 30% and 19 lost more than 30%. Of the 131 respondents who were not operating below optimum levels, 97 lost only 0% to 10%, 16 lost 10% to 20%, 10 lost 20% to 30% and only eight lost more than 30%.

Of those who indicated they were operating below optimum levels, the majority (53.1%) claimed they had replaced "some" of the lost workers, while the majority of those operating at optimum levels (64.1%) said they had been able to replace "all" workers who had left within the last year.

In both cases, a few respondents had managed to replace "none" of their workers — 9% of those operating below best levels and 4.6% of those operating at good levels.

A relatively large percentage of those operating below optimum levels, however, indicated they had replaced "all" workers lost in the past year (57 or 32.2%), suggesting that perhaps other factors besides voluntary quitting had forced them to operate below optimum levels. Budgetary constraints and top management directives could comprise such outside influences.

In an effort to determine why different managers are or are not able to retain or replace DP workers, the survey asked respondents what incentives they offered to keep personnel. Strangely enough, the highest percentages of managers who said they offered "high salaries," "good benefits," "training program," "career pathing" and "other" incentives fell into the below-staff category.

For example, 42.4% operating below staff said they offered high salaries, while 40.5% operating up to staff said the same thing. Of those operating below staff, 56.5% indicated they offered a training program, as compared with 45% of those up to staff.

In addition, 34.5% of understaffed managers surveyed said they had career pathing, while only 29% of those up to staff indicated the same.

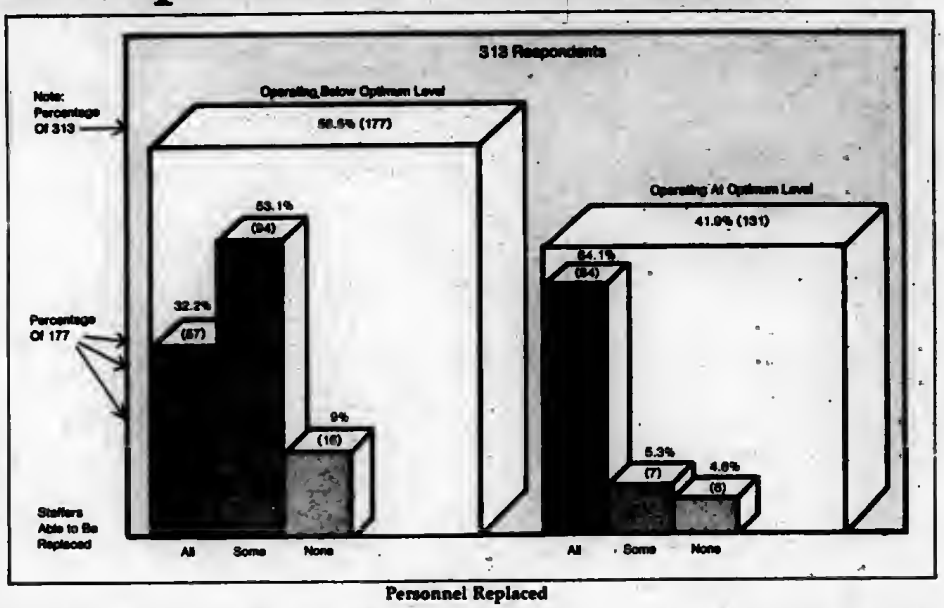
On the other hand, it is noteworthy that 66.4% of those up to staff said they offered good benefits, vs. 64.4% of the understaffed managers surveyed. A number of recent studies have suggested that benefits outweigh money as incentives, a possibility apparently borne out here.

Finally, 31.3% of those up to staff indicated they offered "other" incentives, while 20.3% of those operating below their best levels said the same.

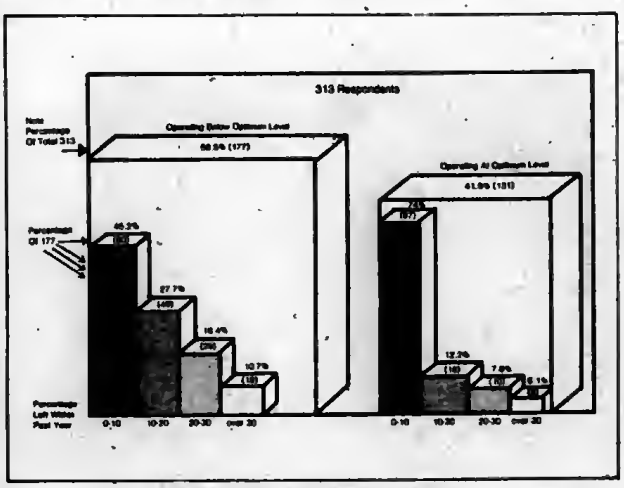
While those results were less than conclusive, a slightly different look at the returns yielded some insight into the situation. Of the 22 managers who had replaced "none" of their lost personnel, only half claimed to offer good benefits, as opposed to 98 out of 143 (68.5%) who replaced "all" and 72 out of 101 (71.3%) who replaced "some."

Ten of the 22 who replaced none, or 45.5%, said they offered a training program, as compared with 78 of 143 (54.5%) who replaced all and 57 of 101 (56.4%) who replaced some. Nine of the 22 replacing none (40.9%) offered high salaries, compared with 68 of 143 (47.6%) who replaced all and 37 of 101 (36.6%) who replaced some.

Six of those replacing none (27.3%) offered career pathing, vs. 43 of 143 replacing all (30.1%) and 34 of 101 (33.7%) replacing some. While the differences in percentage are not overwhelmingly great, it is clear that a greater percentage of managers who offered incentives were able to replace at least some of their lost workers.



Personnel Replaced



DP Staff Turnover Within Past Year

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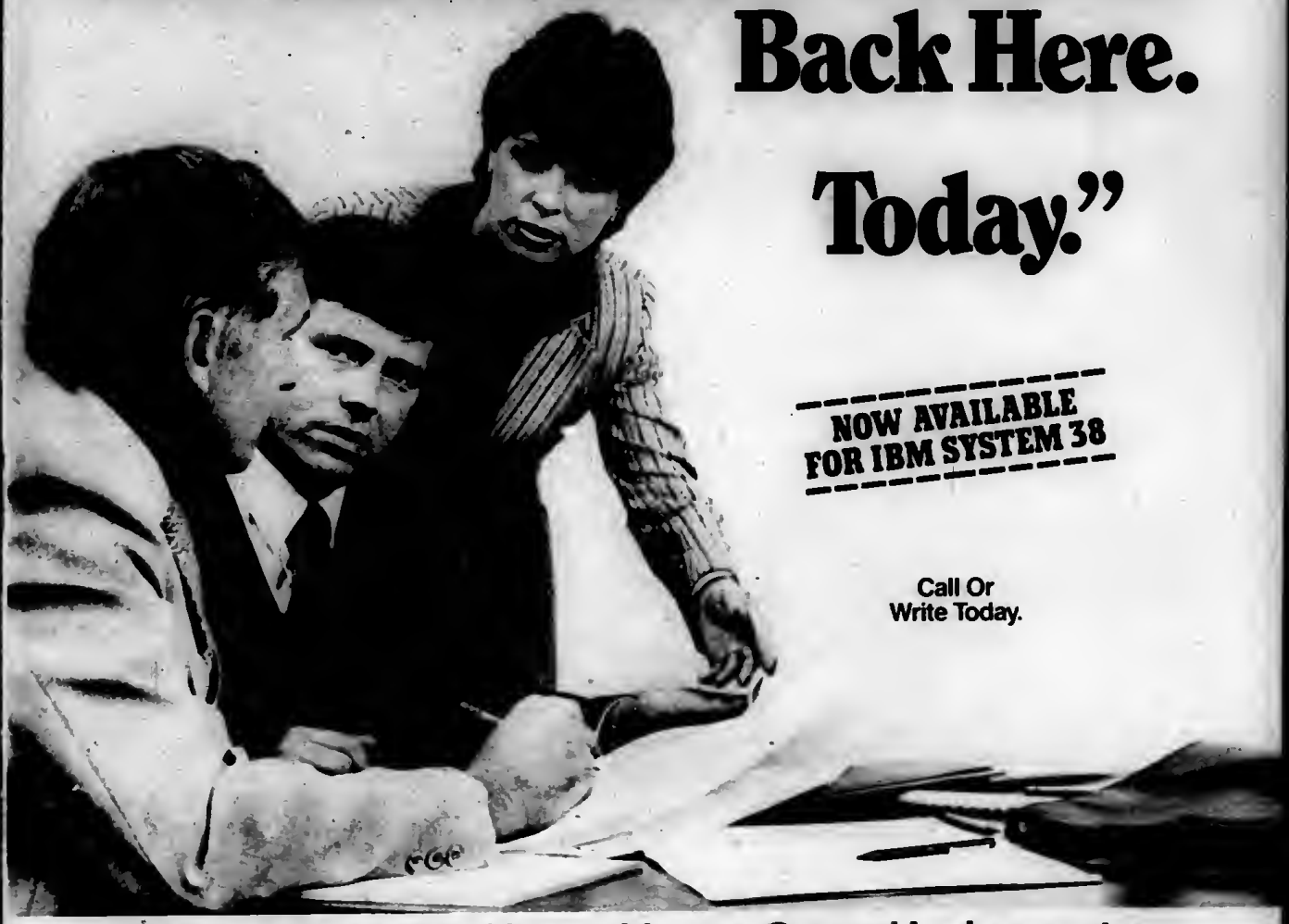

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Users Warned of 'Trusting' Contract Vendors

By Marcia Blumenthal
CW Staff

The vendor is not your friend — at least not when negotiating a contract to acquire a new computer system.

The majority of users fall prey to the "you can trust me" line of vendors and often make major purchase decisions based on whether they feel comfortable with a particular vendor's salesperson, maintained Joe Auer, president of International Computer Negotiations, Inc., a firm specializing in contract negotiations.

When it comes to computer procurement, users do not exercise normal prudent business practice, he charged. The truth is, "the vendor is not your friend," according to Richard Brandon, president of the Brandon Consulting Group, Inc., another firm specializing in developing contracts for users.

IBM made the industry because of its policy of handholding, but as mixed-vendor shops proliferate, the economics for handholding are no longer there, Brandon added. "Users fail because they don't stand up to vendors and ask for reliability or performance guarantees," he noted.

Users Wising Up

But users are wising up. More and more firms are committing the resources necessary to develop sophisticated hardware and software contracts. At some companies the legal department takes the major responsibility for the contracting procedure, but at other firms the DP department is the driving force behind the contracting process.

Whatever the approach, the object of a contract is to keep litigation to a minimum. Not only is it expensive to litigate, but in most cases there is not enough case law on the books to make it clear about a vendor's reaponsibility to make a piece of software work, so the user must rely on the contract.

"If you have to boil it down, the users are looking for accountability and responsiveness from the vendor," offered Frank Aiello, director of planning, contracting and business practices at American Express Co. By contrast, the vendors are looking to limit their liability and, in the case of software vendors, to protect trade secrets, he said.

At American Express, the legal department is largely responsible for computer contracting because lawyers have the training to understand the nuances of the contract language.

The six-person department at American Express evolved from a study done in 1974 by Arthur Young & Co. that recommended a centralized, standardized contracting function. The company has provided user departments with a contract guidelines manual and a request for proposal issues and guidelines manual.

Contracts involving high-risk situations — a new vendor, technology or a turnkey project — or contracts for more than $100,000 in hardware or $50,000 in software must be submitted to the legal department.

Caution Advised

At Celanese Corp., Vice-President Michael J. Samek said he signs no piece of paper without the law department's approval. "You can get in as much trouble with a $100 contract as you can with a $10,000," he said.

But Samek relies primarily on a contract administrator who started out as a DP professional and now functions in some ways as a paralegal. "I can't deal with a lawyer whose first question is 'what's software'," he noted.

Samek, head of management information services at Celanese, was surprised to find he was reviewing 25 to 30 contracts per month prior to creating the administrator position.

Contract Procedures a Must

By Marcia Blumenthal
CW Staff

The establishment of firm contract procedures is often an evolutionary process.

Randall G. Kominsky, staff counsel at Ryder Systems, Inc., took a personal interest in computer contracts because he felt the firm got burned when it signed unmodified contracts. The DP department, at first, did not see the necessity for intensive contract review, he recalled.

But in the last year and a half that attitude has changed. "We are no longer willing to sign standard vanilla contracts," he said.

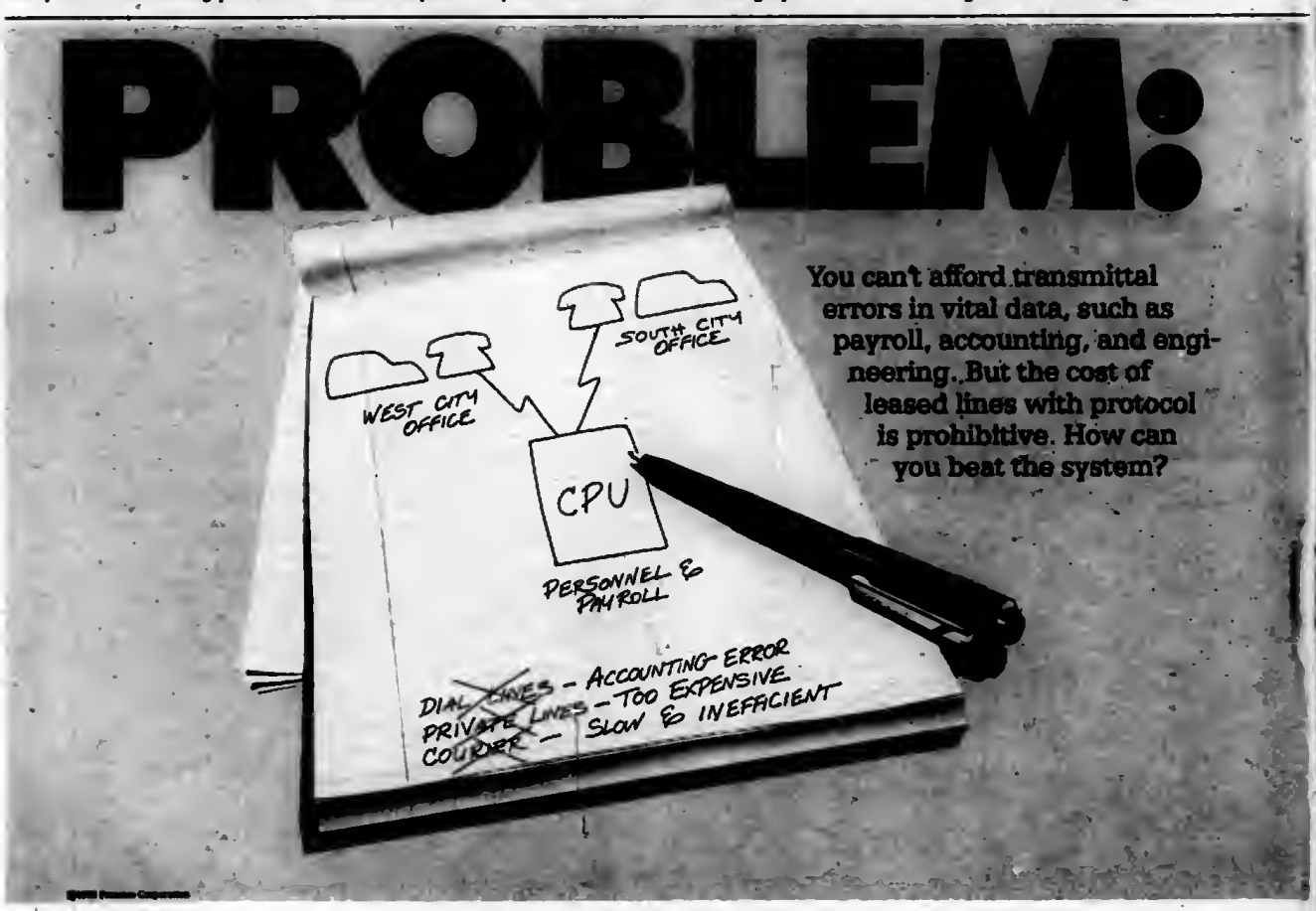
In the past, only major contracts were reviewed by the legal department, but today all computer-related contracts go through Kominsky, who is now training a second lawyer for the department.

Kominsky singled out software contracts as particularly horrible. He is now developing a standard contract for software and testing it within the company.

Standard contracts may become the norm for users. International Computer Negotiations, Inc. is working with a major aircraft manufacturing firm and a provincial government in Western Canada in a joint venture arrangement to develop standard contracts. To date, the partners have developed 11 contracts, which will be sold to users of all sizes.

While Ryder and other major corporations have the resources to devote to developing contract procedures, other users are not so fortunate.

Guilliano Gnugnoli, executive director of computer and information services at Georgetown University, has made it a point to become expert in contracting; he advises user departments within the university about the dangers of accepting vendors' claims as gospel.



Alternative to Divestiture Possible

Government Still Trying to Break Up Bell?

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Whether the government la still trying to break up the Bell system was a popular question here last week.

On Aug. 6, Assistant Attorney General William Baxter told the Senate Judiciary Committee the government would be "content, even enthusiastic" to accept S. 898, tha Senete's pending rewrite of the 1934 Communications Act, as an alternative to divestiture provided two emendments are added.

One amendment would gear Western Electric's equipment sales within the Bell system to its "outside" sales; the other would be aimed at assuring network interconnection on equitable terms to Bell's competitors.

This statement was repeated at e press conference last week. Baxter also said then that if the legislation is "pretty well along" and tha trial is still underwey, he will recommend terminating the letter.

Government's Statement

On Aug. 3, three days before Baxter's eppearance in front of the Senate Judiciary Committee, Gerald Connell, the Justice Department's chief ettorney in the AT&T case, told presiding Judge Harold H. Greene that "the relief sought by the plaintiff . . . continues to be the relief we have been seeking throughout the trial . . . and it has not changed."

In other words, the government still seeks divestiture of Western Electric and/or other key parts of the Bell System. Connell has not amended his statement since then.

According to enother member of the government's trial staff, Connell's statement, just before it was made, was approved "within the highest levels of tha administration." He admitted there is "some inconsistency" between what Connell said and what Baxter said.

Baxter eppeered before the Judiciary Committee after the Reagan administration, late last month, worked out an agreement with AT&T under which the government would drop its antitrust charges end Bell would support en amended communications bill [CW, Aug. 3].

The agreement came about lergely because Commerce Secretary Malcolm W. Baldridge and Defense Secretary Casper Weinberger wanted the government's antitrust suit withdrawn.

Despite this high-level support, the egreement fell epart shortly efter it was made when Judge Greene refused to go elong with it. He would not recess the trial for the 11 months requested by the Justice Department to ellow time for an amended communications bill to be enacted.

Baxter, who presented the recess petition personally to Judge Greene, said at the time that the administration has concluded there is "no realistic possibility" of enacting the legislation unless "this case is put on ice." However, at the Judiciary Committee hearing, the administration was considerably less assertive.

The chief spokesman, Baldridge, said the conclusion that the antitrust suit was blocking passage of the bill really came from Republican members of the House and Senate and from the fact that since the trial began in 1974, two attempts to amend the 1934 Communications Act have ended in failure.

Democrats Disagree

However, Democrats in both the House and Senate disagree with this reasoning. In the wake of Judge Greene's refusal to delay the trial, AT&T has announced it no longer supports the equipment amendment; but judging from what was said e short time later at the Judiciary Committee hearing, the Reegen administration is totally behind this provision.

It is also supporting a second emendment to S. 898 aimed at guarenteeing AT&T's competitors feir access to the telephone network. Without both changes, Baxter said, S. 898 "would not seem to me to be eccepteble."

Regarding the "equipment" amendment, Baldridge explained that "much of the domestic market for telecommunications products is foreclosed to competitors of Western Electric" and "there is no effective marketplace check on prices for which Western Electric transfers products to affiliated firms. The amendment . . . has as its major effect the establishment of e marketplace check on internal Bell system transfer prices. The amendment should also substantially lessen the 'market for foreclosure' problem."

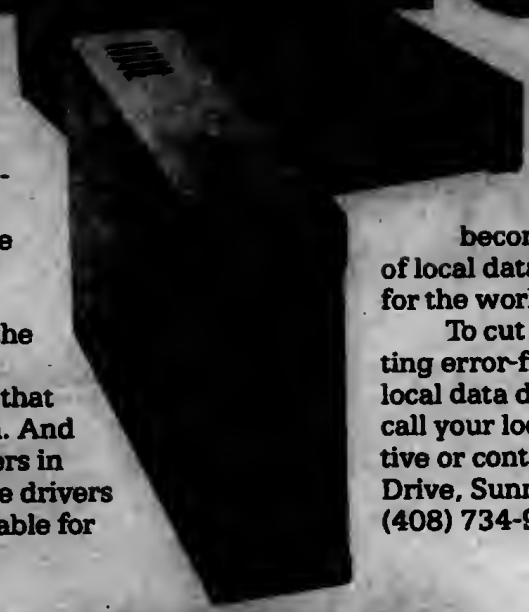
Dim View

However, AT&T's competitors — particularly the Computer and Communications Industry Association (CCIA) and North American Telephone Association (Nata) — take a dim view of all of this.

Nata's counsel, Ed Spievack, said that terminal equipment seems to be outside the scope of the amendment and if it is, "the problems alluded to by tha administration won't be resolved even if the emendment does what it's supposed to do."

Spievack added that the "market check" mentioned by Baldridge assumes that AT&T will not subsidize both its "inside" sales to Bell operating companies and its "outside" sales to others. This could be done for $300 million to $500 million, according to the Neta counsel, end he considers it "e price AT&T would gladly pay to eliminate competition."

SOLUTION:



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Lewis Admits Guilt in Electronic Bank Heist

By Bill Laberis
CW Staff

LOS ANGELES — A former bank operations manager who allegedly punched the keys in the biggest-ever computer fraud and electronic bank heist pleaded guilty here last week to conspiracy and embezzlement charges.

L. Benjamin Lewis admitted in U.S. District Court to his part in the computer-aided scheme uncovered in February, which netted more than $21 million from the Wells Fargo National Bank [CW, March 2, 9].

In admitting guilt, Lewis agreed to testify against Ross Fields, alias Harold J. Smith, the boxing promoter believed to have frittered away the proceeds of the heist on his extravagant lifestyle and on a string of losing fight promotions.

Lewis also agreed with the U.S. Attorney's office here to testify against Sammie Marshall, another of Fields' promotion cohorts and a former loan officer at the bank. Fields and Marshall will be tried on 32 counts of fraud and conspiracy Oct. 13.

According to bank Chairman Richard Cooley, the scam was made possible by a failure in the bank's system of operating controls. He insisted that the theft was a "systems fraud, not a computer fraud."

But Lewis, although in a relatively low-level position, was clearly able to circumvent the bank's computerized controls and take advantage of its electronic branch settlement system.

In essence, Lewis' scheme is believed to have worked like this: He began by electronically creating a fictitious deposit at one branch bank, then crediting the deposit to an account at another branch. Knowing the computer was programmed to signal an anomaly within five days if the credit was not cleared, he then wrote up another fictitious credit ticket to cover the first deposit, doing all the "paper work" from behind his computer terminal.

The task for Lewis then was to write up a third and a fourth fictitious deposit to cover the ever-growing sums being siphoned off at the various branches, settling all such accounts within the five-day grace period allowed by the bank's computer. The computerized "kiting scheme" thus continued.

To do this week after week meant Lewis had to forego vacations, something that went unnoticed at the bank.

When the rolled-over fictitious deposits reached $1 million, Lewis had another problem — he found the computer would red-flag any items in excess of $1 million. So he began making multiple entries in several different fictitious accounts, being careful not to exceed the $1 million limit in any one account.

All was well for nearly two years until he inadvertently filled out the wrong side of one deposit ticket, summoning the first computer red flag and the initial inquest into Lewis' activities.

Lewis could receive a sentence of up to five years in prison and a $10,000 fine for his part in the theft, authorities said.

IEEE Supports Soviet Scientist

DALLAS — Participants at a recent Institute of Electrical and Electronic Engineers (IEEE) computer conference here sent a petition to the Soviet Academy of Sciences on behalf of Russian computer scientist Viktor Brailovsky, recently convicted of anti-Soviet activities.

Brailovsky, a cyberneticist, was arrested after several years as leader of a Moscow group of Russian dissident scientists. He and his wife had first applied for exit visas 10 years ago.

At the IEEE conference 40 computer engineers asked the Soviet academy to intercede with the Russian court that is now considering Brailovsky's appeal of his five-year sentence.

Earlier this summer the U.S. National Academy of Sciences also petitioned the court on Brailovsky's behalf [CW, May 14].

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Zeroing In With CPUs

U.S. Customs Steps Up Attack on Border Crime

By Bill Laberis
CW Staff

BOSTON — U.S. Customs Office investigators here are relying more on computer technology to stem both rising customs crime and eroding operating budgets.

Robert DiLorenzo, regional investigations director here, has been given the mission by the Reagan administration to fight the illicit transborder flow of arms and American high technology. But he has not had the money to fill any vacancies on his 13-person staff in three years.

So DiLorenzo and agents at the eight other regional investigations offices are turning to computers. Ironically the agents' increasing use of computer-assisted investigations may hasten an end to the avoidance — willful or otherwise — of substantial customs duties by large U.S. computer manufacturers.

"We've used the computer experience gained in a sort of landmark case a few years ago as a precedent to help in future investigations [of other computer manufacturers] in this area," DiLorenzo said in a recent interview.

Landmark Case

The "landmark case" concerned an unnamed computer manufacturer with overseas manufacture and assembly operations, explained Al Frare, regional agent-in-charge.

Over a period of several months the company had been importing foreign-made computer components to the U.S., passing the shipments off as American-made goods that were returned to the U.S. after not being sold or assembled abroad. This "American Goods Returned" status grants such shipments immunity from customs duties.

Through covert sources and intense port-of-entry searches, the agents unearthed the company's scam, finding semiconductors made in the Far East passed off as "American Goods Returned."

However, further investigation showed there had been scores of illegal entries by the same company, with eight to 12 invoices per entry and 200 to 300 high technology items per invoice, each item identified by a specific parts number.

"We created a data base listing all the parts we knew to be of foreign manufacture," Frare said. "Then we ran this information along with shipping records we obtained by warrant to find out the extent of the illegal entries. This kind of cross-checking operation would have been exceedingly difficult if not impossible without the computerized data base."

The agents found the OEM had avoided nearly $1 million in customs duties, of which $500,000 has been repaid through a compromise settlement.

Since then the agents have greatly expanded their data files to include a broad range of computer parts known to be of foreign manufacture.

The files, accessible by agents on an on-line basis, are aiding the regional office in the investigation of at least one other prominent computer manufacturer. This other manufacturer is suspected of having made more than 2,000 illegal shipment entries over the previous two years, although liability will depend on whether it can be proved the manufacturer willfully or unwittingly cheated the government.

Yet in the money scheme of things, duty avoidance is small potatoes compared to the roughly $50 billion in annual drug trafficking or millions more in stolen goods that cross international borders and therefore fall under the customs agents' purview.

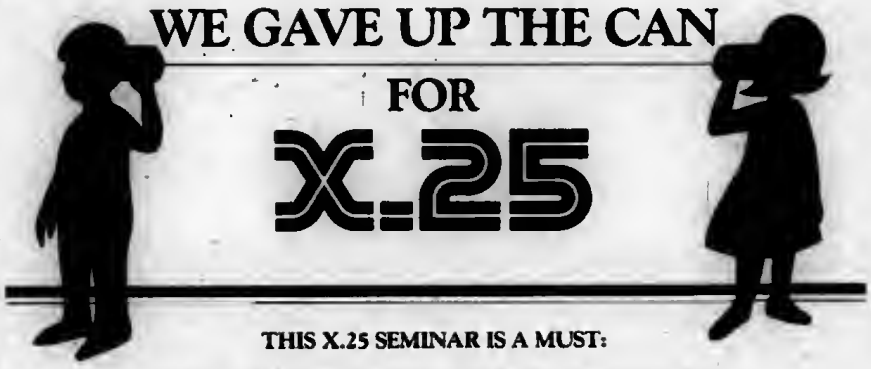
In these areas customs agents are using an ever-broadening series of data bases to monitor and stop the flow of illegal goods and to observe the movement of national and international suspects and fugitives.

In 1970, the Treasury Enforcement Communications System (Tecs) began operating. Tecs today is a system of more than 1,000 telecommunications terminals located in ports of entry and border stations across the country and connected on-line with a Burroughs Corp. B-7700 mainframe in San Diego, Calif.

In addition to the Customs Service, Tecs is now used by the U.S. Bureau of Alcohol, Tobacco and Firearms; the Internal Revenue Service Inspection Service, Intelligence Division and Drug Enforcement Division; Department of State; U.S. Coast Guard; and Interpol, the international police.

With Tecs, terminal operators within seconds can summon biographical information from investigative files on any suspect. File information is culled from data bases at the National Crime Information Center, 48 out of 50 state registry of motor vehicle offices, the treasury department and several other state and federal computerized information files.

"We can get a complete make on somebody almost instantaneously, and at least watch him if we have no call to arrest or apprehend," DiLorenzo said.



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Karp and Weir Are Back Again

Peggy Karp is a recognized authority on CCITT standards. As Executive Director of Product Engineering, she is responsible for the design and specification of new products and interfaces for GTE Telenet public and private network systems.

Don Weir is currently Director of Research and Planning for GTE Telenet. His duties include planning, system design, and development of advanced products including packet radio, broadcast satellite and local area megabit lines.

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Prop. 2½ Slices Mass. Municipal DP Budgets

By Bill Laberis
CW Staff

Municipal DP budgets across Massachusetts are languishing in the wake of a radical tax-slashing referendum passed overwhelmingly by voters last November.

Following years of steady and often rapid growth, computer-related expenditures for fiscal 1982 in virtually all the state's cities reflect no real growth, with large declines in some cases, according to a *Computerworld* survey of the eight largest cities in the state.

Proposition 2½, the tax-limiting referendum being blamed for the cuts, is similar to tax proposals being mulled now in eight other states and also similar to Proposition 13 passed in California in 1978.

The upshot of Proposition 13 has been the scrapping of many municipal DP expansion plans [CW, Jan. 19]. Still further cutbacks are anticipated in California as the full blast of Proposition 13 combined with expected federal revenue sharing cuts percolate down during the next few years.

In Massachusetts, most municipal DP directors interviewed say they are struggling now to maintain the same levels of service delivery this year as last. They admitted, however, that service cuts are inevitable as lean budgets are exhausted.

Of the state's eight major cities, four have funded their DP departments at lower levels than last year, three at the same level and one at a level slightly higher this year than last.

But with an annualized inflation rate of about 11%, none of the cities' DP budgets grew; in fact, all but one declined in real terms.

These reductions come at a time when increasingly greater demands are being placed on the cities' DP departments, most of the managers noted. Ironically the increased damands are also a product of Proposition 2½, as budget cuts in other municipal departments are forcing a greater reliance upon DP shop resources.

City fathers in Boston, where fiscal wheels traditionally grind exceedingly slowly, have not yet approved a 1982 budget, even though the current fiscal year began nearly two months ago.

However, preliminary DP department budget figures available from the City Auditor's office show a projected 47% cut in the department budget, a figure that the office stressed is a "worst case budget."

Cut Inevitable

Other sources within the department said a cut of some unknown size is inevitable, and will come at a time when the department is trying to consolidate its six operations centers into one cohesive unit. Boston, like almost all the state's cities, was racked particularly hard by Proposition 2½, with deep budget cuts ensuing across the municipal board.

Worcester, the second largest city in the state and in New England, funded its DP department for 1982 so that it just kept up with inflation, the only city to do so. Charles Woodbury, assistant city manager, explained this relative largesse in terms of an intended expansion of the department's applications.

"Starting Sept. 1, they [the DP department] are going on a seven-day, 24-hour service basis, something we planned for a while so the police can go on-line with a new tracer system," Woodbury said. "Actually the department has received the blessing of the City Council and is on a high priority should any more funds be found."

On the other hand, the DP department in Lynn, an ailing factory city north of Boston, was forced to axe 25% from last year's budget figure, with slightly smaller cuts lopped from other municipal budgets.

"We haven't begun cutting services yet, but problems are developing already, especially in data entry," said William Clancey, DP manager. "In time, some applications will have to go, but I don't know which ones yet."

Similar stories were aired by DP managers further up the coast in Peabody and Salem, where budget cuts totaled 10% and 21%, respectively.

In Salem's case, the budget cut will mean a $40,000 shortfall in the city's seven-year purchase obligation for its Sperry Univac 90/30, according to DP director Richard Fabiszewski. Payment default, he said, could land tha city in court with Univac.

"At budget time the mayor kept the personnel component of our budget intact, slicing a big chunk off equipment rentals, which is dumb because of contractual obligations," he said. "The whola thing is stupid, because he either has to come up with the money and stop playing politics or go to court and fight."

Meanwhile, DP departments across the state are awaiting increased state aid designed to partially offset the effects of Proposition 2½. But it is generally conceded that the lion's share of any such aid will go to bail out beleaguered school, police and fire departments.

With state budget figures not yet fully finalized, Ben Segal, director of the state's Bureau of Systems Operations, said his department is expecting a "significant shortfall in our funding over what we had originally requested."

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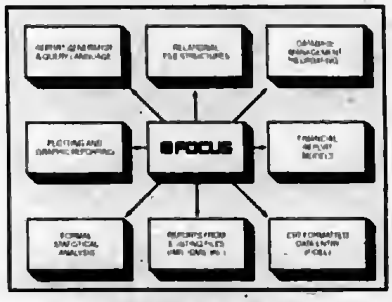

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Security Legislation Seen on Upswing

WASHINGTON, D.C — Computer-related privacy and security legislation is on the upswing, according to the Third Privacy & Security Federal and State Legislation Status Report issued by the Computer and Business Equipment Manufacturers Association (Cbema).

The current total of state privacy-related bills being tracked is 69, up from 58 two months ago, the report stated. The increase in the number of bills is mainly traceable to bills reported from California and Hawaii.

As of June 30, eight privacy-related bills have been signed into law this year, according to the report. Georgia now has a Computer Systema Protection Act, prohibiting certain computer crimes, fraud, damage or destruction of computers. Montana's governor has also signed into law a computer-related crime bill, the report noted.

The report, which contains a list of relevant federal offices and telephone numbers, is available free from Cbema at 1828 L St. N.W., Washington, D.C. 20036.

House Advises Caution

U.S. Firms Continue Interest in Zip + 4: USPS

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C.— American firms are still interested in converting to nine-digit Zip Codes despite a congressionally mandated two-year delay in the implementation schedule, according to the U.S. Postal Service (USPS).

A Postal Service spokesman last week said USPS had so far received 300 requests for copies of the computer tapes containing the national data base of the expanded Zip + 4 codes and 1,000 copies of the program's sample tapes.

However, on Capitol Hill, House aides were cautioning U.S. firms to proceed slowly in converting to the longer Zips, noting that the recent House-Senate agreement to dealy the program prohibits the Postal Service from offering any rate discount to mailers using the new Zips [CW, July 27].

Study Requested

One member of the House Government Operations Committee staff noted Congress has requested a study by its auditors — the General Accounting Office (GAO) — prior to the Oct. 1, 1983 implementation date for the Zip + 4 project, suggesting adverse findings by the GAO might prod Congress to kill the program altogether.

"Businesses would be ill-advised to make any kinds of expenditures in advance of the GAO report," the committee aide said. The report is due by the end of 1982.

The legislation to delay the program permits USPS to disseminate information on the program and give mailers the new codes, according to a spokesman.

The Postal Service will also be allowed to purchase the optical character recognition and bar coding equipment it plans to use for sorting the longer codes, but will be prohibited from sorting letters by the nine-digit Zips before the 1983 start-up date.

Because companies cannot expect a rate discount or better mail service by using the longer numbers any time soon, the benefits of converting to the nine-digit Zips should be minimal for most mailers for several years.

But mass mailing companies that use Zips to target their markets and firms that could use the longer number for better in-house mail routing procedures might benefit by early conversion.

And a private postal consultant suggested last week the potential long-term benefits of the Zip + 4 program will persuade many mailers to begin conversion before Congress makes up its mind on the final shape of the postal automation program.

Acceptance Inevitable

National acceptance of the longer Zips might be all but assured by the time Congress takes final action, according to Jon Jay Daly, president of John Jay Daly Associates, Washington, D.C.

"Neither legislative legerdemain, cartoonist caricatures or the public's aversion to increased digitization can stay the Postal Service's couriers from the eventual completion of adding zillions of digits to millions of addresses" is Daly's lighthearted description of the program's outlook.

It was just that sort of prior commitment to the program and a growing national sense of inevitability about the longer Zips that prompted Congress to direct USPS not to advertise or promote them before the 1983 implementation date.

It was feared the Postal Service or the public might become locked into the new system before Congress has a chance to make a final determination on the program.

"My concern is that allowing the Postal Service to take off on a media blitz promoting the plan before the Congress has its report on the value of the nine-digit proposal is a little bit like letting the train out of the station with no passengers," Rep. Gerald Solomon (R-N.Y.) said in a recent debate on the longer Zips.

Referring to continued national advertising of the Zip + 4 program and reports postal employees are urging mailers to convert, a House committee staffer said "The Postal Service is not complying with the spirit of the [House-Senate] agreement."

He explained that any USPS suggestions that mailers would benefit by converting before final congressional action would be "inappropriate."

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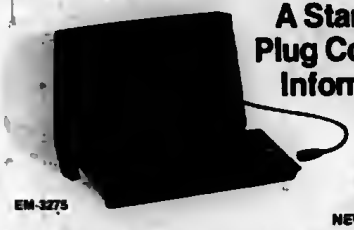

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IBM, Citicorp Credit Launch Third-Party Lease Program

By Marcia Blumenthal
CW Staff

ARMONK, N.Y. — Under a cooperative arrangement with Citicorp Industrial Credit, Inc., IBM late last month started an experimental program to allow users to lease through a third party some products sold on a purchase-only basis.

This is the first time IBM has offered a cooperative third-party leasing arrangement in the U.S. The firm has had similar programs with some financial institutions in Canada for several years, a spokesman noted.

The products now available for the test lease program are the General System Division's System/34 Models 1, 2 and 3 and the new System/23 Datamaster desktop unit and the Executive Copier Model 102 marketed by the Office Products Division.

Users who wish to lease these products obtain lease application forms from their IBM sales representatives. Customers apply directly to Citicorp Industrial Credit for the leases, which are offered on a full pay-out basis only.

Marketing Productivity

Ostensibly, the test is to make it easier for customers to lease equipment and to "increase marketing productivity for IBM" for these products, the spokesman noted.

These low-end products have not been widely available through third-party lessors and dealers, although many users do approach third-party vendors to arrange lease deals for them.

At the end of the test period, IBM will evaluate the feasibility of extending the option to other products, the spokesman said. Currently, the Series/1 and the 3101 terminal are the only other popular IBM products sold on a purchase-only basis, but such a third-party lease program could eventually be extended to other systems.

Option Extended?

Kenneth Pontikes, president of Comdisco, Inc., said he would not be surprised if IBM eventually extended the same option to higher end products.

Loading the lease burden off to third parties is a method IBM could use to keep its purchase/lease ratio at the level optimal for the company's earnings — in other words it could be a pressure valve if IBM's lease ratio gets too high, Pontikes reasoned. The IBM spokesman said IBM would also evaluate the program for its potential to reduce the lease burden.

On the whole, Pontikes does not think the extension of the leasing program will hurt the third-party industry. "When IBM has a lease price, it's an umbrella, but when they don't there is no umbrella, so we don't have to compete on price."

Datacomm Briefs

FCC Proposes Enlarging DTS Frequency Spectrum

WASHINGTON, D.C. — The Federal Communications Commission (FCC) has proposed enlarging the frequency spectrum authorized for Digital Termination Systems (DTS), a wideband local loop offering for data communications users inspired by Xerox Corp.'s Xten announcement in 1978.

Although Xerox has killed Xten, several other companies have expressed interest in DTS, and one supplier — Isacomm — has requested authority to construct networks in 30 cities [CW, Aug. 10].

Previously, the FCC allocated 200MHz to DTS in the 10.6GHz spectrum. Early this month, the commission proposed adding another 200MHz, this time in the 18GHz band.

After requesting comments from interested parties, the commission noted that, despite Xerox's retirement from the scene, demand for DTS frequencies may exceed initial estimates — especially since the commission's latest pronouncement will, if adopted, allow private operators as well as commercial carriers to establish DTS networks.

In the initial ruling, the FCC provided frequencies for up to 10 DTS networks in each city.

The new proposal, if implemented, will increase that number substantially, while providing greater opportunity for entry by smaller firms and promoting a wider diversity of DTS services.

Final adoption of the FCC proposal is possible by the end of this year, a spokesman said.

AT&T's Rate of Return Under House Investigation

WASHINGTON, D.C. — The House Commerce Committee's oversight and investigations subcommittee has launched a massive investigation of the 12.75% to 13% rate of return AT&T won from the Federal Communications Commission (FCC) last April.

As a direct result of the Commission's action, domestic message toll service, private-line and Wats rates have increased significantly, forcing the nation's telecommunications users to pay an estimated $2 billion/year in additional charges.

The subcommittee, chaired by Rep. John Dingell (D-Mich.), is concerned partly because the rate of return authorized by the Commission was higher than recommended by an FCC trial examiner after a two-year investigation.

The examiner explained the maximum return should be 10.87%. The phone company was allowed a 10% return prior to last April's FCC ruling.

The subcommittee ordered FCC Chairman Mark Fowlar to turn over all documents connected with the rate of return decision as well as the Commission's subsequent authorization of the related rate increases.

Despite Possible Breakup

Report Projects AT&T to Dominate Wideband

By Bruce Hoard
CW Staff

NORWALK, Conn. — AT&T will be subdivided and the daughter entities of that division will dominate U.S wideband communications in the future.

That is one of the findings of a far-ranging report entitled "Growing Impact of Wideband Communications" recently released by International Resource Development, Inc.

The 205-page study discusses the history, opportunities, impacts, various modes and key issues involving wideband communications.

Traced to Phone

The dominance of AT&T is traced back to the introduction of the telephone. The report notes the present structure of the Bell System was "essentially in place" within 10 years after the telephone was patented.

From there, it describes how Bell bought up independent telephone companies, refused to sell equipment to its competitors and eventually came to a position of preeminent communications power.

Addressing the breakup of Bell, the study envisions a residual Bell system of local telephone companies, an openly competitive manufacturing arm in Western Electric Co. and an unregulated supplier of communications and computing services.

"In this scenario, both Western Electric and the unregulated business would be major U.S. corporations in their own right," it said. "They would start with major resources at their disposal, with a major customer base and a vast reservoir of expertise."

Fueled by the technological expertise of Bell Labs, this troika of business entities is assured of continued dominance in the emerging U.S. wideband communications market, the report reasons.

In the area of computer-based opportunities, today's computer and minicomputer vendors have the chance to control the computer-related needs of controlling and operating wideband digital electronics.

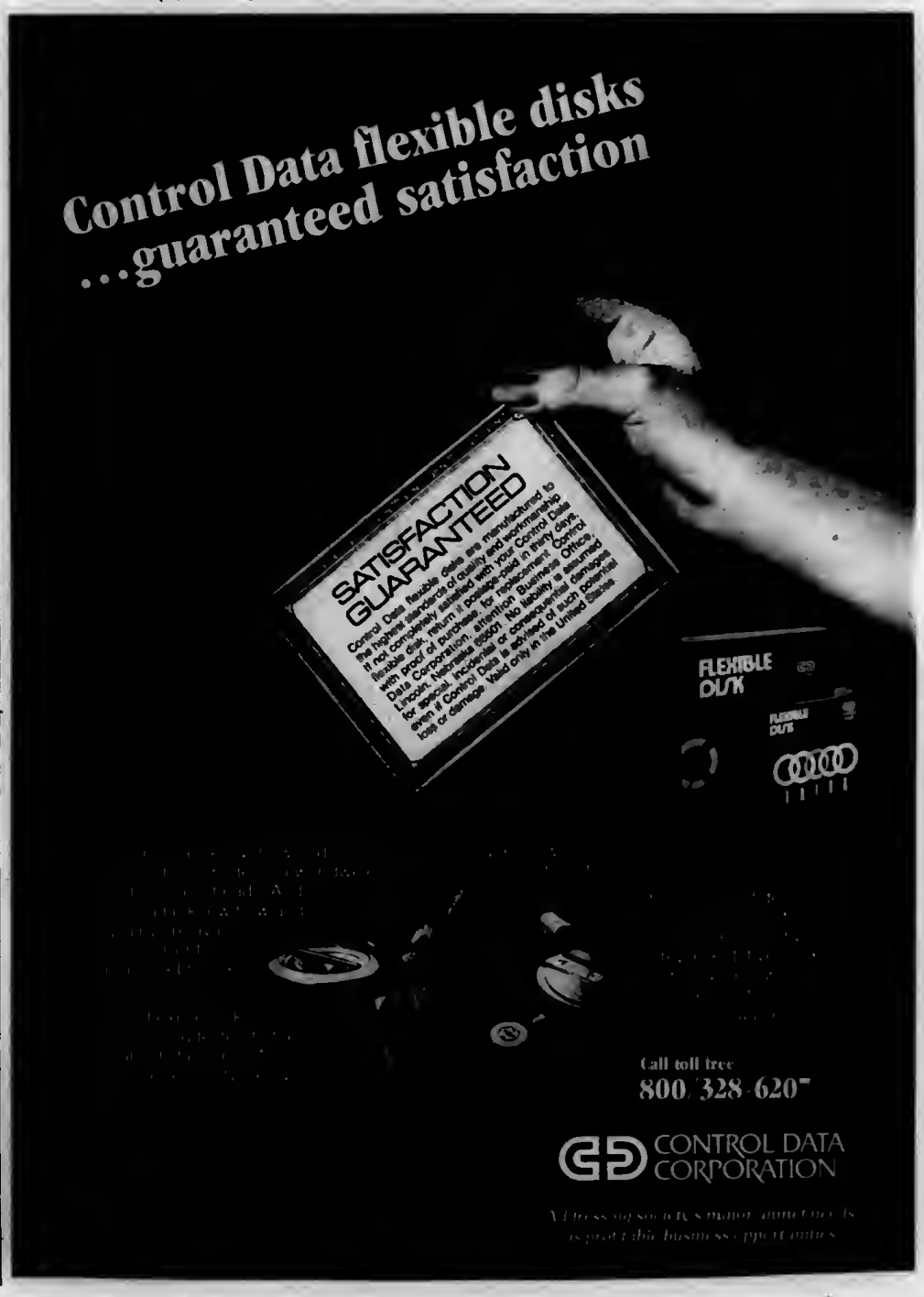
They are also poised to develop the terminals and systems needed to implement wideband communications.

Terminal manufacturers such as Wang Laboratories, Inc. are working to combine word processing and DP terminals within a common communications network. The goal of such a plan is to create "the integrated executive terminal," which is expected to become "the basic equipment for offices throughout the country."

IBM and Xerox Corp. are the leaders in the race to develop the office of the future, given their financial and technical resources. "Either of these companies can produce virtually anything," the study said.

Arpanet, the nation's first packet-switching network, which was established by the U.S. Department of Defense in 1969, is called "one of the great learning tools of our time." By carrying data packets over the Bell system's T-Carrier channels at 56K bit/sec, it has become the nearly error-free basis for communications networks.

The report went on to predict the seven-layer Open Systems Interconnect model being developed to govern communication between variant computers will be adopted with few, if any, alterations.



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Offering 49 New Data Elements

IRS to Share More Tax Info with States

By Bill Laberis
CW Staff

WASHINGTON, D.C. — It is either going to be harder to cheat on your state income tax return or a lot easier for the states to detect who is not paying their fair share, depending on your point of view.

Starting this October, the Internal Revenue Service will expand the magnetic tape information it shares with the state tax offices, offering 49 new data elements in addition to the 39 it had exchanged in previous years.

Taken together, the data elements form a line-by-line biographical sketch of each of the nation's 90 million taxpayers, listing personal identification information as well as key line-item data from the principal federal tax return forms, according to the IRS.

The new information provided on request will include the IRS' audit selection scores as well as tax data from returns filed on self-proprietorships, capital gains and losses and income earned from rents, estates and trusts, according to the IRS.

Other Options

Other source tape options include federal form line items listing child care credits, energy conservation credits and moving allowances taken.

The audit selection scores in particular may prove a boon to those states whose present DP department funding and resources prohibit the more advanced audit screening techniques employed by the IRS, the tax agency indicated.

The federal audit selection scores are totaled during processing time when all line items on the 1040 and 1040A forms are scored and then weighted on the basis of a national average.

The scores are totaled and then ranked numerically, with those returns at the top of the rankings usually selected for auditing [CW, April 14, 1980].

"Basically we went out and canvased the states to see what they need in the way of tax information," Michael McCormick, IRS disclosure specialist, said.

"The data we can provide them now will make it easier to check on income reported and can also be used as part of their planning to ascertain how changes in federal tax laws will affect state revenues," he explained.

No Guarantee

McCormick added that the availability of the additional information is no guarantee that a state will receive it. Rather, an individual state must prove it has a legitimate need and the need is related to state tax purposes exclusively, he said.

"In short, states with no state income tax — there are about 10 — receive no information," he said. "But as far as I know, all the rest can and do get the tapes, or at least a portion of them."

McCormick said the states are strictly forbidden from passing any of the tape information on to county or municipal taxing entities, even though the tapes become the exclusive property of the states that buy them.

"I know we have used them extensively for at least 15 years," Richard Osborn of the Franchise Tax Board in California said.

"Whether we use the new information remains to be seen. I am not so sure their [the IRS'] audit selection criteria are the same as ours," he said.

Osborn said the tapes had previously been used to red-flag discrepancies between the federal returns filed by the state's 10 million taxpayers and their state returns.

"Basically they have helped us bring out a lot of the non-state filers," according to Osborn.

Karen Townsend, apokesperson for the New York State tax department, said her state's use of the confidential material in the tapes is more strictly limited by state law then by federal guidelines.

"We use them for some satistical revenue studies for our in-house use," Townsend explained. "I don't know how much help any of the new information is going to be."

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Despite Rapid Growth Graphics Not Yet Accepted

By Tim Scannell
CW Staff

DALLAS — Computer graphics has come a long way since the days when it was regarded as backroom technology reserved for researchers and far-fetched scientific applications.

The market is growing by leaps and bounds, with sales expected to reach about $14.5 billion by 1990. However, there are snags in this technological paradise.

For the most part, according to industry observers, computer graphics is still geographically isolated from the data it represents. And for all its market growth, especially in the computer-aided design and manufacturing (CAD/CAM) areas, computer graphics has yet to be fully accepted by decision makers in the business community — the very people who are most often caught in an information flood, according to Peter Preuss, president of Integrated Software Systems Corp. (Issco).

Issco currently markets two data representation systems — Disspla and Tell-A-Graf — and is a leading independent supplier of graphics software, according to International Data Corp. (IDC) figures.

Devil's Advocate

As representative and chief promoter of his company at the recent Siggraph/81 conference here, Preuss made little effort to hide his enthusiasm for the computer graphics field. It was on the crest of the computer graphics wave that Issco rose from a small noncapitalized business in the late 1960s to become a multimillion dollar international corporation.

However, when given the chance, he could not resist playing the industry devil's advocate, pointing out areas that he felt could stand some subtle and not-so-subtle doses of improvement.

• For instance, rather than off-handedly inject the term "computer graphics" into every sentence, Preuss prefers to refer to the science as "data representation graphics." The latter, he feels, more correctly describes a tool or bridge that enables data to be more easily transferred from the computer to the mind.

Preuss does not even like to use computer and graphics in the same breath. The former, he said, when used to precede the latter has always meant "I'm sorry, it isn't good enough graphics."

• While computer or data representation graphics has achieved a phenomenal growth in the past decade, its benefits have chiefly been enjoyed by the CAD/CAM and scientific sectors and the artistic departments of large multibranch corporations. But decision makers in mid-size and single-branch companies have yet to fully recognize graphics as a viable in-house tool, Preuss said.

"Everybody whom we are making an impact on wants more and more, so the solution seems to be right," Preuss maintained. "But the penetration has yet to happen."

• Currently, most executives regard computer-based graphics as an informational second thought with its roots at the large-computer data center across the street. To be effective from a business standpoint, a decision maker must have a computer system capable of representing data in two forms: the printed word and graphics, Preuss said.

If graphics are geographically separated from the data, then it is just a form of automating the artist rather than giving the business analyst a tool, he noted.

• A true executive data graphics system will most likely be some sort of a distributed stand-alone graphics data station that is functional enough to perform all sorts of graphics calisthenics, but simple enough to be operated by the nontechnical business analyst, Preuss stated.

"Graphics belongs and will, over the next five years, primarily reside next to the data," he continued. "Wherever that data happens to be."

• Finally, Preuss, who likes to attribute his company's success to his well-aimed intuition and a hefty research and development budget, pointed out that small businesses would be the next sector to discover the benefits of data representation graphics. But not for at least five years.

CICS Course Set for Sept. 14

NEW YORK — Sysed, a division of Integrated Computer Software, Inc., is offering a one-day command-level course in CICS on Sept. 14 for programmers experienced in Cobol, PL/I or Assembler languages.

Taught by Robert Blumfeld, director of education for Sysed, the hands-on course will require students to program and test a data entry and file maintenance system made up of four programs.

Since the course gives special attention to such basic on-line concepts as multitasking, pseudo-conversational programming and screen design, previous exposure to CICS concepts is reportedly not a prerequisite.

The CICS training course can also be scheduled on-site at a company's installation. Sysed is located at One Park Ave., New York, N.Y. 10016.

Johns Hopkins Plans DP Inventors Search

NEW YORK — Johns Hopkins University will hold a national search for inventors who have developed computer aids to assist the handicapped on Aug. 22 at the World Trade Center here.

The New York event will produce winners who will be part of 30 national finalists competing for a $10,000 cash prize. Categories being addressed include computer-based aids for the blind, deaf and mentally retarded and for people with learning disabilities, neurological and neuromuscular conditions and the orthopedically handicapped.

The event will be held from 9 a.m. to 5 p.m. in the lobby of the Two World Trade Center building.

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Ad Agency Finds It Pays to Computerize

PITTSBURGH, Pa. — While advertising is often considered a glamour industry, tracking ad placements and measuring their performance is a tedious but necessary task.

KM&G International, Inc. has developed an on-line system to perform this important function.

Until recently, KM&G had been doing much of this on an outside time-sharing computer. But when the on-line system is brought in-house, the agency will be able to cut almost in half what it pays outside just for local market broadcast schedule tracking. And that includes KM&G's investment in both hardware and software.

If savings were the economic factor behind deciding to go in-house, it was the prospect of an "edge in getting business" that made the data base-oriented, disk-operated system eventually installed even more inviting.

The previous system could not bring together the different facets of the business. "We now have the ability to draw from a data base and report in a close time frame. This is important to the agency, because it pinpoints trouble areas," noted Ernest Mikulla, manager of systems and programming, computer services. All financial data is being matched to estimates and reports prepared for separate entities served by the agency — the client, account manager, profit center and corporation, he continued.

These capabilities were part of the criteria set down by the four-person committee formed by KM&G to select a replacement system. KM&G's requirements were in keeping with those of most broad-based advertising agencies. Where they differed was in the size of the system, which may vary according to an agency's billings.

Based in Pittsburgh, KM&G, with billings of more than $250 million, is the biggest advertising agency in Pennsylvania and the 25th largest in the world.

"We took the classical approach to selecting a [computer] vendor," Mikulla recalled. After studies and listing requirements, the team sent requests for proposals to 11 vendors. Four were in the final running.

What KM&G finally chose was the Sperry Univac 1100/60 (Model C1), with 700M bytes of disk storage, three magnetic tape drives, a general communications subsystem, five UTS 400 video display terminals and a BC/7 minicomputer, which was vital to conversion.

Univac also had the necessary software and conversion support. The conversion was accomplished by five people between October 1979 and May 1980.

The KM&G approach was somewhat unusual in that the testing and debugging were done on a Univac 1100/10 operated by Giant Eagle Supermarkets 25 miles away. The Giant Eagle computer was linked on-line to the BC/7 and UTS 400 terminals in Pittsburgh.

Applications were converted on a one-to-one basis, using the ACCS file converter to run 75% to 80% of them.

Punched program cards were entered into the BC/7, which transmitted the data to the Giant Eagle computer. KM&G set aside three disk drives at the Giant Eagle site.

Meanwhile, KM&G programmed on-line using conversational time sharing (CTS) and UTS 400 terminals. In this way, a programmer was able to accomplish in one day what it ordinarily would have taken five days to do.

Involved in the conversion were 150 batch Cobol programs, 70 data base Cobol programs, 50 RPG programs that had to be rewritten in Cobol Report Writer and 30 Fortran programs.

Before the Univac 1100/60 arrived, KM&G ran its applications on the Giant Eagle computer in "miniparallel" for two weeks and "full-stage parallel" for one financial cycle.

Although the Univac computer has been in operation since May 1980, not all applications are fully in place. The system is handling accounting functions and employee timekeeping for cost accounting and profit analysis purposes.

Time also is being kept on public relations projects and the computer is storing 75% of the narrative that goes into client reports.

Still to be installed is the important local market broadcast schedule tracking system, for which KM&G now pays a substantial amount to an outside data center. "Part of the mandate for the new system makes this one of our top priorities," H. Stuart Hayes, vice-president and director of advanced analytical systems, pointed out. It involves 200 programs and is to be phased in over an 18- to 24-month period with portions planned for quicker implementation.

The system involves over $30 million of spots on 2,500 television and radio stations. It is based on each client's media plan and the orders placed with the stations. Order information is entered into the computer by station, day, time, expected audience levels, goals and costs. Revisions and preemptions are entered into the computer file as they occur.

Using its own mathematical model for radio and television and a magazine model common in the business, KM&G determines how much to spend for different media and expected cost efficiency.

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Using IBM 360/178

Uncle Sam Mobilizes for Oct. 1 Registration

By Lois Peul
CW Staff

WASHINGTON, D.C. — A centralized computer system at Great Lakes, Ill. will be handling the Selective Service System's registration activities beginning Oct. 1.

Final testing currently is underway on the computer center, which will be shared with the Military Enlistment Processing Command (Mepcom). This is the agency that conducts required physical and mental examinations for draft registrants and, in peacetime, for those enlisting in the all-volunteer service.

The center will be equipped with an IBM 370/168 mainframe operating under MVS with 6M bytes of memory. Storage will consist of IBM 3350-type disk devices, IBM 3420-equivalent tape drives and printers.

IBM's CICS package will be used as a teleprocessing front end and Intel Corp.'s System 2000 data base management system will form the basis of the system, according to David Cox, associate Selective Service director for management information systems.

Registration Functions

The computerized system will remove some of the functions formerly performed by the local draft boards in communities that coordinated information, heard appeals, classified registrants and recorded address changes.

Because the country currently is in a standby posture regarding the draft, it is not possible to have local draft boards set up throughout the country, Cox explained. Registration processing therefore will be handled in the central location. When 18-year-olds register, the information will be fed into the central data base.

Processing forms, sending confirmation letters and changing information such as addresses will take place in the Great Lakes center.

"We get millions of address changes per year that we have to process, so that will be our primary activity," Cox explained. The computer center is a joint operation with Mepcom, Cox said, because Selective Service has a shared responsibility with this organization in the event of a mobilization.

Because of the close working relationship between the two agencies, "we wanted to make sure that both of us had the proper computer support to perform our functions in both a peacetime and a wartime environment," he said. This was the reason for the colocation in Great Lakes.

Cox explained that information resulting from physical and mental examinations performed by Mepcom will be entered into the computer, but these files will be totally separate from Selective Service's files.

"There is no comingling of information. There are very strict security and privacy procedures to safeguard the integrity of the data," he maintained. "What we are doing is sharing a common resource," he added.

Each organization will have separate DP staffs working at the Great Lakes center, Cox said, noting there will be some overlap with regard to technical resources such as executive software.

Even in the current standby environment, there are local draft board volunteers available, as necessary, to handle claims and appeals. Cox said that in the event of a draft, claims and appeals still would be handled through these draft boards. The computer system would be used to schedule hearings and to record the results of these proceedings, he said.

The move to a computerized system was motivated by a desire for increased efficiency and cost effectiveness, Cox said. "It will therefore cost 10 [million] to 12 million this year, as opposed to 50 [million] to 60 million on a decentralized basis," he added.

The centralized system will perform all of the registration tasks, including collecting forms and sending out confirmation letters, for less than $2 per registration.

Last year, the Selective Service System arranged to "borrow" keypunch personnel from the Internal Revenue Service and the Social Security Administration for a wide-scale registration done during the summer of people born in 1960 and 1961 and done in January of people born in 1962. Those activities were completed on time, within budget, and involved 95% compliance of the 18-year-olds registering, Cox said.

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Managers on the Move

Eleanor M. Luce

ELEANOR M. LUCE has been named to the newly created position of director of management information systems (MIS) for Olin Corp. in Stamford, Conn. She will now, oversee the corporatewide strategic direction of MIS activities to enhance the productivity of information systems.

Luce, who came to Olin in January 1980, was formerly manager of corporate systems projects. Prior to that she was manager of management systems. Before joining Olin, she was employed by Reader's Digest Association, Inc. and RCA Corp.

Luce holds a B.A. from Clark University in economics and an M.B.A. degree from Pace University. She has also completed the executive education program at Harvard Business School.

•••

EUGENE L. DANIELS was recently appointed vice-president, information management, for Burger King Corp. based in Miami. In his new position, he will be responsible for all corporate information processing, telecommunications and office automation for the fast-food chain.

Daniels joined Burger King in 1980 as director of systems planning and special projects. Before that, he was president of Erickson Associates, a consulting firm in Butler, N.J., and prior to that he worked as director of information services at Schering-Plough Corp., a pharmaceutical company in Kenilworth, N.J., where he worked for 10 years.

A graduate of the University of Rochester with a B.S. degree, Daniels also holds a graduate degree in business from Columbia University. He is also a past-president of the Pharmaceutical Computer Systems Association.

•••

STEPHEN J. STAPLETON has been promoted to data processing manager for Hendrie's Frozen Foods, Inc. in Southborough, Mass.

The former operations manager joined Hendrie's in 1970. He will now work in systems planning and supervising as well as purchasing.

Stapleton attended Burdett Business College for Management and is a member of the North American Honeywell Users Group and treasurer of the Northeast Region Honeywell Users Group.

•••

GEORGE E. BUCHIK has been named vice-president of management information systems (MIS) at Zale Corp., a jewelry merchandise retailer based in Dallas. Buchik assumes overall responsibility for corporate data processing operations, including the data center, and MIS applications and development.

Prior to joining Zale, Buchik was employed for two years as director of systems development at Associated Dry Goods in New York City. He has also held the positions of vice-president of

Eugene L. Daniels

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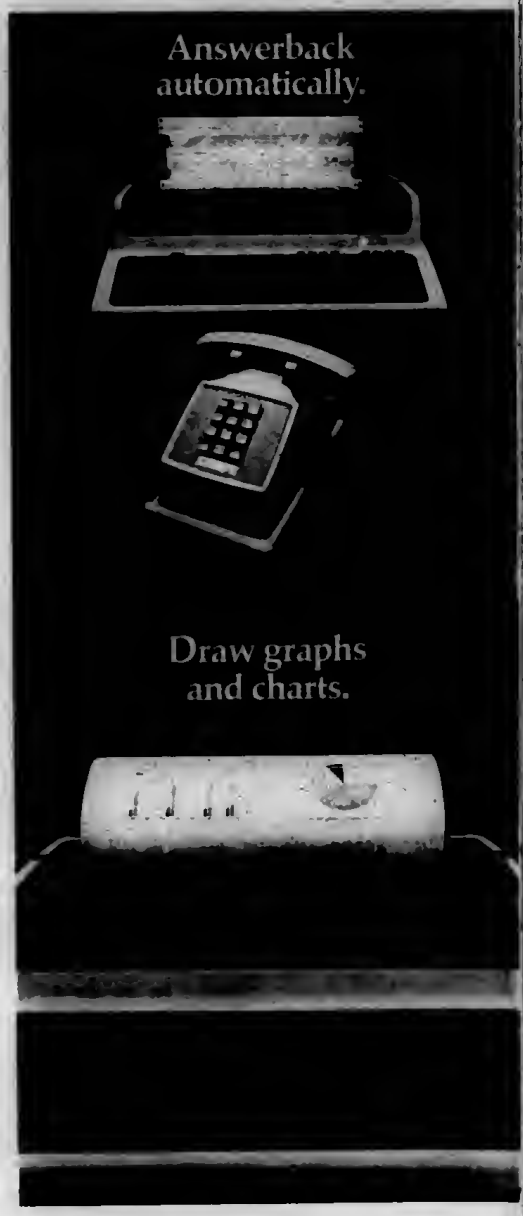
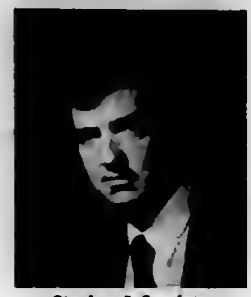


Managers on the Move



Stephen J. Stapleton

technical services and vice-president of credit operations for the retail credit card division of Citicorp., Inc.

Buchik holds a B.S. in industrial administration from the University of Illinois and has attended the Northwestern Graduate School of Management.

•••

CRESTON HUTCHINSON has been appointed executive director of the consolidated data processing center of the City Water Board of San Antonio, Texas.

Hutchinson, who recently retired from the U.S. Air Force with the rank of lieutenant colonel, is a former pilot and navigator and was chief of the applications software development division of Air Training Command, Randolph Air Force Base, also in San Antonio.

Hutchinson is a graduate of the University of Nebraska, and earned his M.A. in business administration from Southwest Texas State University. Before coming to Randolph, he was deputy director of data automation for the Pacific Air Forces, Honolulu.

•••

JAMES COOKE, director of computer services, has been named a vice-president of Wells Fargo & Co. Realty Services, headquartered in San Francisco.

George E. Buchik

Cooke originally joined Realty Services in 1973. He was born in Indonesia, attended Holland's Lorentz College and the Royal Dutch Air Force Academy.

•••

STEWART C. ROBERTS of Stanhope, N.J., has been promoted by the eastern division of Suburban Propane Gas Corp. to supervisor, systems/programming. In his new position he will supervise all systems analysts and programming personnel.

Roberts joined the company in 1962 as an auditor, and prior to his recent promotion, he was senior systems analyst at the Whippany, N.J., home office.

A member of the Association for Systems Management, Roberts is a past-president of the Western New Jersey chapter and is currently vice-president and division director of N.J. Division 24. He attended the University of Wyoming, studied accounting at LaSalle University in Chicago, and business management at the Alexander Hamilton Institute in New York City.

•••

TERRY JOHNSON has been named DP operations manager at Valspar Corp. in its corporate headquarters in Minneapolis.

Johnson will be responsible for data entry, data control, computer operations and technical support.

A computer science major from Morehead State University, Johnson joined Valspar in 1978 as a systems analyst. He has held several posts since that time, most recently computer operations manager.

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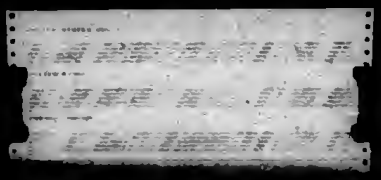

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Calendar

Sept. 1-3, Detroit — **Computer Graphics Seminar.** Contact: Boeing Computer Services Co., Suite 401-W, Parklane Towers, Dearborn, Mich. 48126.

Sept. 1-3, Wellesley, Mass. — **EDP Quality Assurance.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 1-3, New York — **Minicomputer Fundamentals.** Contact: Boeing Computer Services Co., New York Training Center, 560 Lexington Ave., New York, N.Y. 10022.

Sept. 2-3, Arlington, Va. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Sept. 3-4, New York — **IMS/VS Command-Level Applications Programming.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Sept. 17-18 in Dallas and Sept. 24-25 in Piscataway, N.J.

Sept. 8-10, Wellesley, Mass. — **Data Communications Fundamentals.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 8-11, Wellesley, Mass. — **Human Relations: Productive Working Relationships.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 8-11, Washington, D.C. — **Structured Requirements Definition.** Contact: Jim Highsmith, Ken Orr and Associates, Inc., 715 E. 8th, Topeka, Kan. 66607. Also being held Sept. 15-18 in Seattle and Sept. 22-25 in Chicago.

Sept. 8-11, Piscataway, N.J. — **CICS/VS Testing and Debugging.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 9-11, Piscataway, N.J. — **Advanced OS/VS JCL and Utilities.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 9-11, New York — **On-line Systems Design.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 9-11, Seattle — **MVS Debogging — Cobol.** Contact: Boeing Computer Services Co., Box 24346, MS/9A-90, Seattle, Wash. 98124.

Sept. 9-11, New York — **On-Line Systems Design.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181. Also being held Sept. 14-16 in Wellesley, Mass. and Sept. 30-Oct. 2 in Philadelphia.

Sept. 9, Boston — **Necom '81.** Contact: Jo Ann McDonald, Norm De Nardi Enterprises, 289 S. San Antonio Road-204, Palo Alto, Calif. 94022.

Sept. 9-11, Arlington, Texas — **Project Management and Control.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 10-11, Wellesley, Mass. — **User's Role in Systems Development.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 11-13, Philadelphia — **Black Data Processing Associates Annual Meeting.** Contact: BDPA National Chapter, P.O. Box 7466, Philadelphia, Pa. 19101.

Sept. 13-15, Fort Wayne, Ind. — **Advanced Office Systems Seminar.** Contact: Jim Tunis, Lincoln National Corp., P.O. Box 1110, 1300 S. Clinton St., Fort Wayne, Ind. 46801.

Sept. 14-15, Boston — **Software: A Legal Briefing for EDP Professionals.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Sept. 21-22 in New York and Sept. 28-29 in Columbus, Ohio.

Sept. 14-16, Dallas — **DL/1 Applications Programming.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Sept. 21-23 in Piscataway, N.J.

Sept. 14-16, New York — **EDP Disaster Recovery: How to Develop and Maintain a Plan.** Contact: EDP Security, Inc., 181 West St., Waltham, Mass. 02154.

Sept. 14-17, New York — **Data Base Design: Principles and Procedures.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 14-17, Philadelphia — **Structured Programming: Techniques for Productivity.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181. Also being held Sept. 22-25 in Wellesley, Mass.

Sept. 14-18, San Francisco — **Data Base Administrators Workshop.** Contact: Anthony Formica, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 14-18, New York — **CICS/VS Macro-Level Applications Programming.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

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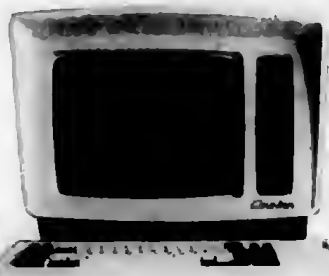

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System Capacity Fizzles; Bottler Sues Consultant

BILOXI, Miss. — A soft drink manufacturer here is suing its computer consultant for $150,000, claiming the firm made the wrong recommendations on two occasions. The consultant contends it made the right recommendations, but that the bottler just underestimated its needs.

Barq's Bottling Co., Barq's Inc. and Barq's Rentals filed suit July 23 in U.S. District Court here against Tudor Systems, Inc. of Charlottesville, N.C., claiming the consultant wrongly recommended the bottler buy an IBM System/34.

Heeding Tudor's recommendation, Barq's said it installed the System/34 processor with 27M bytes of disk storage in April 1979 and found itself out of disk capacity the following September.

Barq's wanted to add more software, but claims IBM said the system could not be expanded. Tudor contends the system could be expanded but that Barq's was unwilling to wait about 18 months for IBM to deliver additional disk storage.

Tudor contends Barq's gave the consulting firm erroneous predictions of what functions the processor would perform. In addition, the rootbeer vendor apparently experienced greater than expected success during the six-month period, and that success put further demands on the processor, Tudor said.

At that point the firm decided to sell the System/34. However, for reasons Barq's attorney William Guice could not explain, Barq's went back to Tudor and asked the firm to recommend another system.

This time Tudor recommended a Texas Instruments, Inc. 990 Model 6 with 50M bytes of disk storage. Tudor Pres. William Tudor said his firm made the recommendation because TI could deliver the systems virtually immediately, thus solving Barq's memory problems.

Again Barq's heeded the advice and installed the system in February 1980. However, instead of getting six months' use out of the system, Barq's claims the TI processor was too small from the beginning.

In addition, the bottler charged Tudor had promised to provide software for the 990 that was never delivered.

Tudor said all the contracted software was supplied, but Barq's former programmer refused to install it. That, Tudor theorized, is the reason the system failed to work properly. Tudor added the programmer made unspecified modifications to the system.

Tudor also contends Barq's never voiced its complaints with the 990. Furthermore, Tudor said Barq's has yet to inform the consulting firm of its plans to sue.

A hearing date has yet to be set, according to Guice.

Carnegie-Mellon Raises Ante In Computer Chess Stakes

PITTSBURGH, Pa. — Carnegie-Mellon University has established two new prizes for computer chess under its trusteeship, supplementing the $100,000 prize for the first computer program to defeat a human World Chess Champion, originally founded by the Fredkin Foundation in 1980.

A prize of $5,000 will be awarded for the first program to attain Master rating in competition with human players, and another prize of $10,000 for the first program to attain a Grandmaster rating. (Grandmaster is the highest rank in human competition; there are fewer than 200 Grandmasters in the world.)

The competition will be held during the International Joint Conference on Artificial Intelligence in Vancouver, B.C., at which time the reigning computer chess world champion, the Belle program written by Ken Thompson and Joe Condon of Bell Laboratories, will face Canadian Master Carl Storey.

Further details are available from Carnegie Mellon's Department of Public Relations, Schenley Park, Pittsburgh, Pa. 15213.

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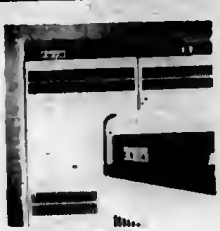

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Saudi Students Find Quiet Welcome in Midwest

By Lois Paul
CW Staff

WARRENSBURG, Mo. — The Saudi students are doing well in the Midwest farming community surrounding Central Missouri State University (CMSU), according to David K. Tickemyer, director of the Saudi Arabian Training Project there.

According to Tickemyer, CMSU is "small enough to be personal and big enough to offer what they needed."

CMSU was selected on the basis of the program it had to offer, he said, adding that the university also has had contact with the Saudi Arabians on other projects.

"We offer a conservative Midwest community. It is not a reactionary big city place where the kids could get lost," he said.

The population of Warrensburg numbers 13,000 and the two major industries are farming and the university.

Tickemyer described the area as a diverse and friendly community in which the students could operate. "We don't have the radical elements a lot of communities would have."

Due to the crisis in Iran last year, Tickemyer said there is a tendency for many Americans to think all Middle Eastern people look and are alike. "The students have done a good job of handling this diplomatically," he said.

The first inkling of the contract preceded the resolution of the hostage situation in Iran this past January.

"In this specific locality, the community has lots of questions," he said, such as "What does this mean to us?" and "How is it going to affect us?" He described the project as a good growing experience for the community.

He said there have been many calls from community people asking what they can do to help and, generally, inquiring about the students.

A program of having families aponsor the students for weekends, dinners and holidays currently is being organized. Local churches also have offered assistance in this regard, deapite the fact that all of the students are Muslim.

"There are communities in which this might not have worked as well," Tickemyer said, noting that he is ready for any problems that may arise, recognizing that there is the potential for future difficulties.

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FEATURE	Visual 400	Lear Siegler ADM-42	Perkin Elmer 1251	ADDS Regent 40	Hewlett Packard HP, Model 26	Beehive DM80
ANSI X3.64 Specified	STD	NO	NO	NO	STD	NO
Set-up Modes Eliminate External Switches	STD	NO	STD	NO	NO	NO
Typomatic Solid State Keyboard	STD	NO	NO	NO	STD	NO
Detached Keyboard	STD	STD	OPT	NO	STD	STD
CRT Saver	STD	NO	NO	NO	NO	NO
Block or Underline Cursor	STD	NO	STD	STD	STD	NO
80 and 132 Columns	STD	NO	NO	NO	OPT	NO
Double Size Characters	STD	NO	NO	NO	OPT	NO
Smooth Scrolling	STD	NO	NO	NO	OPT	NO
Horizontal Split Screen	STD	NO	NO	NO	STD	NO
Video Attributes Require No Display Space	STD	NO	NO	NO	STD	STD
5 Area Qualifications	STD	NO	NO	NO	NO	NO
5 Resident Nat'l Char. Sets Including Line Drawing	STD	NO	NO	NO	NO	NO
Programmable Non-volatile Function Keys	STD	OPT	STD	NO	NO	NO
Display of ALL Control Codes	STD	STD	STD	STD	NO	STD
Insert Delete Line with Push Up or Down	STD	NO	NO	NO	NO	NO
Insert Delete Character with Push Right or Left	STD	NO	NO	NO	NO	NO
Select Editing Extent to Field, Area, Line, Page	STD	NO	NO	NO	NO	NO
20 mA Current Loop	STD	STD	OPT	OPT	OPT	STD
Programmable Message Framing (non-volatile)	STD	NO	STD	NO	NO	NO
Programmable Answerback	STD	NO	STD	NO	NO	NO
Baud Rates to 19200 BPS	STD	NO	NO	NO	STD	STD
Independent Xmit/Receive Rates	STD	NO	NO	NO	NO	NO
Printer Port Independent of Communication Interface	OPT	OPT	STD	STD	OPT	STD
Paging	OPT	STD	NO	NO	STD	STD

HCR to Hold Unix Seminars

TORONTO — Human Computing Resources Corp. (HCR) will hold a series of two-day introductory seminars beginning next month here and in three major U.S. cities focusing on Bell Laboratories' Unix operating system.

Aimed at software managers, consultants, analysts and programmers, the courses will cover Unix philosophy, files, programming, program maintenance and text processing.

The courses will be held here on Aug. 26-27 and Nov. 4-5, in Boston on Sept. 23-24, in San Francisco on Oct. 14-15 and in Washington, D.C., on Dec. 2-3.

The registration fee is $425. More information on the courses and HCR is available from the firm at 10 Mary St., Toronto, Ont. M4Y 1P9.

'Here Come The Support Chips.'

Saudi Arabians at Central Missouri State

Middle East Meets Midwest in DP Training

By Lois Paul
CW Staff

WARRENSBURG, Mo. — Twenty Saudi Arabian students will be hitting the books and the terminals here as part of a 26-month DP training program at Central Missouri State University (CMSU). The program is supported by a $400,000 contract from the government of Saudi Arabia.

The students, who range in age from 19 to 26, have spent the past year in the U.S. learning basic conversational English. They are funded by their government and, after completing the training program, will return to work for the Saudi government in DP.

Currently, the students are undergoing a two-month intensive technical English course at CMSU, which is being conducted by Systran, a Chicago company that reportedly is experienced in international language training.

"We are trying to give them some exposure to the words, phrases and expressions used in business applications," Robert Pierce, dean of the School of Business and Economics, explained.

Business Sequence

In September, the students will take classes in the business DP sequence, beginning with Math for Business Analysis, Principles of DP and Introductory Typing. They will participate in regular classes along with other CMSU students.

It is anticipated that the students will be working with NCR Corp. or Sperry Univac mainframe equipment when they return home, although at CMSU they will use IBM terminals connected to the University's IBM 4341 system.

"The concept is that programming skills are transferable," Pierce said. The students will be taught an approach to programming to solve business problems, he said.

"Basically, the program is parallel to what we offer for an associate degree," Pierce said. The business courses will incorporate the concepts and vocabulary of business problem solving.

Programming courses, including Cobol, Assembler and data base concepts, will cover business applications such as building an accounting system or solving modeling problems.

"They may learn systems here that do not apply specifically to their problems, but the concepts are the same," Pierce said.

Future Hosts

CMSU is one of the four U.S. schools that will host the 100 Saudi students taking part in the total program. Saudi students participating will be learning DP (computer software) at CMSU and at Oklahoma State University Technical Institute; they will learn computer technology (hardware) at Weber State College in Ogden, Utah, and the University of Arkansas at Little Rock.

The total cost of the project to the Saudi Arabian government will be approximately $1.7 million, according to Mandil A. Al-Mandil, associate supervisor of the Saudi Arabian Ministry of Interior Programs, Educational Mission.

Previously, there were projects involving DP training of Saudi students at vocational and technical schools, Al-Mandil said, but this is the first project involving universities.

Good Environment

Al-Mandil said CMSU was chosen because it has a good DP department and offers an environment that is good for study. "It is a suitable place for those who want to learn."

It is important for the students to learn a variety of computer languages, including Cobol, he said, and to work with IBM and Univac equipment.

"When they finish, we have to train them again in our center in Washington, D.C.," he said, adding that the students will spend a year in on-the-job training.

DP Instructors

Upon arriving home, they will work at the ministry's Computer Technology Institute as instructors teaching other Saudi Arabians DP and computer technology, Al-Mandil said.

The students will receive a certificate of computer operating ability from CMSU when they complete their 26-month program.

They also will have the opportunity to go on for associate degrees at CMSU if they want to take the additional courses necessary for this, according to David K. Tickmyer, director of the CMSU Saudi Arabian Training Project.

Pierce said the Saudi Mission has discussed the possibility of sequencing another group of students through the program after the current students have completed their training, but at this time no final decision has been made.

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Structured Programming Old Hat at GP

PORTLAND, Ore. — "Structured programming," one of the software buzzwords for the 1980s, has been a reality for more than a decade in the data processing offices of the Georgia-Pacific Corp. (GP) headquarters here. The practice has been standard since GP installed the Adpac business language in the late 1960s.

Mike Moran, GP's assistant director of information systems, runs what amounts to an in-house software shop, serving the company's diversified pulp, paper, chemical, boxcar leasing, distribution centers and manufacturing activities.

Corporate DP operations employ 37 programmers, 20 systems designers, more than 50 people in operations and nine software specialists who maintain operating systems and install new software packages. They use IBM 3031 and 4331 mainframes here and a 360/30 under Edos in Atlanta.

GP is one of a hundred or so firms that installed Adpac as a replacement for Cobol in the late 1960s. Like most of the original customers, the company continues to use Adpac despite the virtual ubiquity of Cobol in DP shops. Adpac compiles faster and is far more efficient for writing source code than Cobol, and its structured form makes programs easier to maintain and document, Moran claimed.

"We do have program packages, purchased from outside, written in other languages. But everything we write outselves — accounts payable, pension plan reporting, sales analysis, some payroll programs — we write in Adpac. And we write almost all interfaces between programs in Adpac," Moran noted.

Adpac is especially useful, Moran added, for any tasks that entail matching and updating multiple files. The Adpac compiler defaults to a system called "Adflow," an internal process control logic that shepherds records through a program, counting records going in and out, opening and closing files and calculating total breaks.

Built-In Structure

Adpac's rigid architecture forces programmers to write structured, easy-to-follow code. Programs are divided into four sections, each with its own form, and the Adpac coding forms will accept instructions in one way only.

"Programs have anatomy, just like humans," said Peter Harris, designer of the language and president of the Adpac Corp. of San Francisco. "We all share a certain basic format of arms, legs, torso, head and so forth. All programs differ, but they also conform to a basic anatomy: an I/O division, a data division, process control and procedures."

Repetitive functions, such as commas in numerical strings or minus signs, can be generated automatically. And the language also follows a set of standard defaults. Unless otherwise indicated, a file with a standard label will default to an input file in the I/O sections, for instance. In Cobol a programmer would have to write as many as 10 lines of code to select the file, assign it to a device, describe it, set the recording mode and so on, he claimed.

For this reason, an Adpac program may have only a third as many statements as the corresponding Cobol program. That makes Adpac programs not only easier to write, but easier to maintain, Moran remarked. GP spends only 25% of programming time on updating old programs; and "bug" maintenance takes only 36 hours per week out of 1,600 programming hours.

Efforts to Improve Cobol

Moran noted that Cobol's wordiness and lack of intrinsic form, making programs lengthy and difficult for anyone but the original programmer to follow or maintain, have become so well-known and annoying that a great deal of effort has gone into the creation of "structured" Cobol.

The chief characteristic of the newer forms of Cobol is the elimination of the GOTO statement, according to Adpac's Harris. This instruction is now regarded as "pathological" in that it permits a programmer to jump from section to section without regard to the main line of processing.

Eliminating GOTOs and requiring programs to be written in so-called "top-down" form, with the most important line of programming at the top and the smaller details in orderly descending fashion, has done a lot to improve Cobol efficiency.

A year ago, GP had to consider switching back to Cobol because it was buying the 4331 and was not sure if the Adpac Corp. would support the upward migration. As a test, Moran converted two Adpac programs into the cleanest, most structured Cobol possible and benchmarked them with the same input files. He found that:

- The Adpac program compiled four times faster than the Cobol program. Execution time was comparable because all instructions wind up in machine language.
- The Cobol source program took six times the disk storage area of the Adpac program, and the object program required approximately twice the space.

To Moran's relief, Adpac's designers did support the move to the 4331.

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Mini Tracks Contributors To Bible Broadcasting

By Lois Paul
CW Staff

NORFOLK, Va. — Contributors to the Bible Broadcasting Network (BBN) may be storing up points for the hereafter, but a down-to-earth hardware and software system is keeping track of their generosity here.

BBN owns and operates a network of nonprofit, noncommercial radio stations, which broadcast religious programming. The major means of support, according to business manager Keith Wohlenhaus, is contributions from the 7,000 to 8,000 listeners received at its headquarters here.

Before computerizing its system, BBN kept manual records of contributions for each station and mailed individually prepared receipts to each contributor. Metal addressograph plates were stamped with each contributor's name and address.

"It was a mess," Wohlenhaus said, describing the mechanical system. There was no capability for receipting and two secretaries were involved in writing receipts by hand — filing one copy and sending the contributors the other.

A computerized system for managing contributor receipts was installed in 1977 to replace the manual technique using the addressograph. The Contributor Receipting System is the software package BBN acquired from K&R Custom Software, Inc. of Newport Newa, Va.

The software initially ran on a Wang Laboratories, Inc. 2200T business minicomputer with 24K bytes of memory. This recently was replaced by a Wang 2200MVP minicomputer with 64K bytes of memory. BBN is using 10M bytes of hard-disk storage with its contributor receipting software and some floppy disk storage with other programs.

Buying Factors

BBN investigated IBM, Burroughs Corp. and Wang small business systems before deciding io install the latter. The reasona for the decision included cost and the fact that "Wang appeared to be easier to work with and more user-oriented than, say, IBM," Wohlenhaus explained.

Another factor was that Wang equipment did not require the separate purchase of operating software, he said. Wohlenhaus writes a number of application programs for BBN and he did not feel IBM could support thia as well as Wang could.

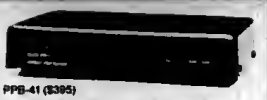
K&R Software was recommended by Wang, Wohlenhaus said. The contributor receipting software package is written in Basic and required less than two months to be fully operational, he said.

BBN ordered the initial Wang 2200T and during the month it took to obtain the equipment, K&R was working on the required software on another Wang computer. When the system waa installed, the customized software was ready, according to Wohlenhaus. "We did not have to spend a whole lot of time sitting here with a computer and no software."

When BBN upgraded to the Wang 2200MVP computer, K&R modified its contributor receipting software package to interface with this system. The computerized system provides for bulk mail handling. It prints letters to each person, including data on how much they have contributed during the year, and also produces mailing labels.

The system also assists the receipting area, keeping records of the dollar amounts given during the year. "We are down to one secretary doing all of this," Wohlenhaus said. Processing has been increased by one and one-half to two times its volume, he added. Receipts are produced in the form of a personal letter, "something we couldn't do before," Wohlenhaus said.

4 Low Cost RS232 INTERFACE PROBLEM SOLVERS



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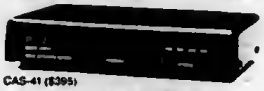

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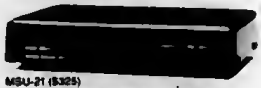

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Two Keynoters Announced For IEEE Compcon '81

WASHINGTON, D.C. — The Institute of Electrical and Electronics Engineers' (IEEE) Computer Society has announced two of the keynote speakers for its Compcon Fall '81 conference. The conference will be held here Sept. 14-17.

One of the speakers will be Dr. Richard DeLauer, recently appointed undersecretary of defense for research and engineering for the U.S. Department of Defense and formerly executive vice-president of TRW Corp.

DeLauer received his Ph.D. in aeronautics and mathematics from the California Institute of Technology and is the coauthor of two books: *Nuclear Rocket Propulsion* and *Fundamentals of Nuclear Flight*.

Also featured will be Dr. Koji Kobayashi, chairman of the board of Nippon Electric Co., Ltd., Japan. He received his doctorate of engineering degree from the University of Tokyo and was chairman of the Information Processing Society of Japan from 1968-1970 and from 1979-1981. Dr. Kobayashi's participation continues the tradition of Japanese contributions to Compcon conferences.

Additional information and advance programs are available from Compcon Fall '81, P.O. Box 639, Silver Spring, Md. 20901.

NIMR Conference to Cover New Information Generation

LOS ANGELES — "Information Systems: The New Generation" is the theme of a three-day conference to be presented here Sept. 30 through Oct. 2 by the National Institute for Management Research (NIMR).

The conference will cover the application of new computer equipment, software, communication approaches and management technologies. Included also will be an examination of latest innovations and methods, and a study of successful case histories in financial information systems.

Keynote speakers at the meeting will include Richard K. Davis, vice-president at Performance Development Corp.; Robert Greco, director of information resources management at McDonnell Douglas Automation Co.; Ed Hibsman, manager of systems and analysis for Management Systems at TRW-Electronic and Defense Systems; Dennis R. Hykes, general manager of financial planning at Control Data Corp.; and Michael E. McCorry, vice-president at Qantel Corp.

A 1,000-page conference notebook containing speaker presentations and extensive reference material is handed out to all attendees.

The cost of the conference is $495. Additional information is available from Department PR, NIMR Seminars, P. O. Box 3727, Santa Monica, Calif. 90403.

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Auditing Meet Set for Aug. 26

WOBURN, Mass. — A three-day computer control and audit seminar will be held in Boston Aug. 26-28 by The Foundation for Continuing Education here.

The seminar reportedly will explore audit techniques and audit software; the acquisition of hardware, software and services; and the problems using library software, distributed DP, minicomputers and data base technology.

The seminar leader is Anthony J. Woodworth, director of auditing at Harvard University.

It will be held at the Logan Airport Hilton and the program fee is $450 for the full three days.

Further information is available from Mrs. Caulfield at The Foundation for Continuing Education, 25 D Olympia Ave., Woburn, Mass. 01801.

Funding Approved For Nacha Survey

WASHINGTON, D.C. — Funding for a survey on "Corporate Trade Payment and the Automated Clearinghouse" was recently approved by the National Automated Clearinghouse Association's (Nacha) board of directors. This survey is being launched to determine the feasibility of having corporate trade payments flow through the automated clearinghouse network.

According to Nacha Pres. W. Robert Moore, the survey is the first substantial step toward providing Nacha with sufficient data to determine what trade payments readily adapt themselves to electronic treatment now and in the future.

Initial research, scheduled to begin in late fall, will include on-site interviews with representatives from major corporations who have expressed interest in the project, Nacha said.

On completion of the interview stage, a workshop will be held for participants to review the collected data and further refine the analysis developed by the Nacha Task Force.

Nacha plans to use the results of this and any additional research found necessary to expand Nacha capabilities to process corporate trade payments, the firm said from headquarters at 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Debate Lingers on Software Theft

Turnaround Time
By Larry E. Long

Q While I appreciate your suggestions to an employee regarding the unauthorized copying of software, I am disappoloted with your comment that it is now "water under the bridge.". This type of attitude has allowed so moch water to go by that a raging sea has been growing at the doorsteps of many software houses. And many of these vendors are often equipped with less than a bucket to clean op the flood.

That one copy of software, now in unauthorized possession of a consultant, could easily spread like wiid fire into the hands of other consultants and, eventually, to oeeding aod unsuspecting end users. The horror stories that float their way back to the vendors are, indeed, borrible.

Not only has the vendor lost control of his software (not to mention the revenues honestly due him) but the end user often finds himself faced with law suits, losses and noofunctioning computer aystems that seem to go hand-in-hand with the unethicai busioess practices of the software pirate.

The entire subject of software protection is demanding far more attention than the media has given it. Hoping for legisiative protection and assistaoce fails to address the probiems vendors are faced with, and it is losing us time ... time in which bootleggers could conceivabiy cripple the industry.. The "spiiied milk" attitude fails to realistically address the situation ... a fact that often escapes those who are not tryiog to mop up tbe flood.

The altuation bas reached such proportions that some vendors, including my owo company, have sought one another out io bopes of at least building a raft of commoo support among ourseives. The Association of Software Protectioo (ASP), thoogh atill primitive, is nevertheless an attempt to develop a unified defense. Had I responded to the qoestion presented to you, I would have demanded he "blow the whistie" and let the vendor know what had occurred. And, just for the record, I am hopiog the veodor is not us.

A I responded to the previous inquiry with the individual and circumstances in mind, and not with respect to the broader issue — abuse of proprietary software. I would iike to initiai your statements and provide a few of my own.

Software thievery is a crime, a severe crime that could have a devastating effect on the future of the software industry. The probiem is compounded because existing circumstances make this piracy a low-risk crime committed by people with an amazing affinity for rationalization. A breach of contract is unlawful and there is no justification.

I have no immediate answers, but I can use this apace to appeai to the MIS professional's pride and sense of ethics to do what is right and just.

Q I am writing to you in bopes of obtaining information on security and control for computer-based aystems.

Specifically, I am interested in information on data base and file security, disaster planning and recovery, preventing access to computer sites, as well as securing the entire aystem.

Additionally, any information you may have on safeguarding the system to prevent unauthorized use and/or articles on restart procedures should a computer aystem be sabotaged would be appreciated.

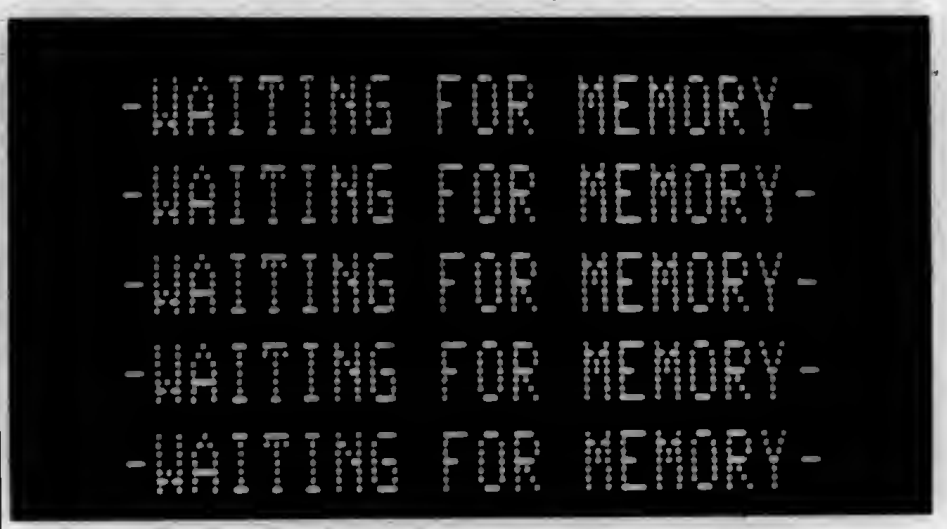
A You've asked for the Watergate tapes, the history of the U.S. (1940 to present) and the court records of the IBM antitrust suit. Most industry journals deai with one or all of the above topics in any given month.

Ask your corporate reference librarian, or one from a local university, to help you identify appropriate articles, papers and books on specific topics of interest.

Even with the untold number of pages written on security and controls, the industry is either not reading or not believing what they read. I regularly see flagrant violations of security maxims and/or systems with limited or nonexistent controls. Some companies and public agencies are living on borrowed time. Annual aystem audits and risk analyses to evaluate the adequacy of controls and security should be routine procedures. The breadth of your question ieads me to believe that you have been assigned these tasks.

Long is a professor at Lehigh University, a DP consultant and author.

Have a question? Send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*



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EDITORIAL

Check References — Or Else

Whatever happened to the fine art of reference checking? In almost any other field, one would not even think of hiring someone who claims to have years of technical experience in a specific area without at least a cursory investigation of the applicant's professional background. Not so in the technician-starved world of DP.

The miniscule size of the experienced programmer/analyst job pool leads many a hard-pressed management information services director to juggle an aspirin bottle with a roll of antacid tablets. With both hands thus occupied and with a headache brought on by the wails of woefully understaffed project leaders, directors experience a distinct temptation to "forget" about checking on anyone who offers a good-looking resume combined with a reasonable familiarity with technical jargon.

"This guy seems to know what he's talking about and we really need a warm body," reasons the pressured manager. "I'd better offer him the job before someone else hires him . . . I can always check his references later." Somehow, later never comes.

In most cases it won't matter. Chances are that a potential employee is being quite straightforward in presenting his skills and experience. But if he misrepresents or — and this is much more likely — improperly emphasizes his real-life expertise, the cost in terms of money, time and wasted effort can be enormous.

In a field in which someone can be dubbed a senior analyst when his entire experience consists of six months spent at maintaining Cobol programs, job titles are not much help. Neither is the amount of time logged at DP jobs a sure indicator of potential. A person who has had five employers in 10 years can be a self-motivated whiz kid who will stay with you forever if you keep him interested. He could also be a confirmed job-hopper who will never be satisfied by any environment.

The picture an applicant presents can be brought into the right focus for you by means of a quick telephone call to a former employer. It can mean saving thousands of dollars and avoiding unmeasurable amounts of aggravation if you find out up front that the personable systems designer you are about to hire has the uncanny ability to alienate end users within two weeks. Perhaps more important, that phone call may keep you from turning thumbs down on a job seeker who looks like a mental midget because of interview nerves.

Either way, reference checking through both formal and informal channels — via the famous DP grapevine — is worth your time. Getting the wrong person for the job is usually worse and always more expensive than waiting to find the right one.

'Ol' Buddy, Why Not Just Grin and Wear It?'

DATA PAST

Five Years Ago
Aug. 23, 1976

WASHINGTON, D.C. — Presidential contender Jimmy Carter told a consumer meeting sponsored by the Public Citizen Forum, a Ralph Nader organization, that there is not enough competition now in the communications business.

Carter further stated that the pending Justice Department antitrust suit against AT&T was a good move in the right direction. The former governor added that he felt the Bell-sponsored Consumer Communications Reform Act was not needed at this time.

Ten Years Ago
Aug. 18, 1971

WASHINGTON, D.C. — The Army "lost" 100 trucks valued at $1.5 million because it forgot to list them in its computerized management information system (MIS), according to a General Accounting Office (GAO) report.

The report declared that an MIS isn't much good if the data is not put into it in the first place, and data in the Army system was so poor the Army was "unable, with any degree of reliability, to determine its needs for equipment." Much equipment was never listed or listed incorrectly.

LETTERS

Mumps Applauded

I would like to congratulate you for the article by Alan Taylor [CW, July 20] on the use of the Ansi standard language Mumps within the Veterans Administration Hospitals. Although the article addressed some controversy about the availability of this work that is beyond the scope of this letter, I would like to point out that the merits of this language do justify more space in your paper.

Mumps was accepted as a standard language through the Ansi committee X11, joining other language standards (Fortran, Cobol and PL/1) approved through subcommittee X3. The process by which it achieved standards approval is being studied as a model for proposing Basic and Pascal for comparable approval.

However, Mumps has not received publicity commensurate with its widespread use and applicability. Perhaps this is due in part to its name, an acronym for Mass. General Hospital's Utility Multiprogramming System, which does not connote much to the DP community about interactive programming and data base management systems.

Perhaps it is because Mumps, as an interpretive language, has not been commercially implemented on some of the large computers that are primarily represented on the Ansi committees such as Cbema and X3. Perhaps it is because the very concept of interactive computing has not been given sufficient attention.

Whatever the reason, Mumps is indeed a powerful language, widely used in medical and commercial enterprises. Mumps now exists in commercially supported versions on a large number of computers, ranging from the microcomputer world (6503, LSi-11, 8080/Z80) through a large number of minicomputers (Digital Equipment Corp., Data General Corp., Tandem Computers, Inc., Harris Corp. and others.)

Implementations are also available on some large mainframes, including PDP-10, Burroughs B6800-7800 and some developmental versions on IBM equipment. Although large mainframe manufacturers have not yet supported the language, it is amenable to implementation on such systems.

The users of Mumps are, surprisingly, predominantly commercial. In Europe, DEC marketers estimate that approximately 60% of Mumps installations are in commercial systems and only 40% in medical or other applications. The same approximate relation apparently holds true for the U.S., although to date, Japan continues to have greater emphasis on medical computing in that language.

The reason for its applicability to the commercial world is its remarkable power in handling text-related data. For example, the concept of a "string subscript," which can be used instead of numeric subscripting to define a hierarchical data base, means that with appropriate retrieval functions it is possible to avoid redundant and time-consuming sorting programs since data can be sorted by the subscript assigned. A subscript can have a real meaning rather than being simply a numerical value assigned by a program.

The efficacy of Mumps in providing large cost benefits over comparable activities in Cobol has been demonstrated in a number of instances, some of them resulting in substantial savings in time, hardware and software dollars and maintenance. With all of these factors in its favor, it appears Mumps deserves a much better shake than it has received to date. Its users would welcome the moral support they richly deserve.

Richard F. Walters, Ph.D
Chairman

Mumps Users' Group
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41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other: _____

HUMAN CONNECTION/Jack Stone

Reader Offers Guidelines For On-the-Job Training

From time to time in this column, I have discussed on-the-job training for DPers and end users — usually in the context of how ineffective on-the-job programs are implemented. It's not that I'm really a negativist — it's just that I don't know of very many installations where management has taken the time to construct a valid on-the-job program for new hires — or for experienced DPers, for that matter.

Happily, a professional in the field wrote a letter to me recently with some interesting and useful thoughts on on-the-job training. Here is an extract of what Rhoda Stern, president of RSA/Information Designs, Inc., said:

"As president of a communications and training service that specializes in developing end-user training materials and documentation for on-the-job use, I should like to alert your readership as to how we, at RSA, proceed.

"On-the-job training is seen as a systematic effort to give users the information they need to do their jobs effectively. It may be delivered initially in a variety of formats: video, slides, structured exercises, guides, job aids, or self-paced individualized courses — including computer-assisted courses. Learners may participate on company time or on their own time. Documentation to follow up and reinforce initial training and to serve as easy reference includes user guides and job aids.

"To ensure accuracy, thoroughness and, most of all, readability, all of our training materials and documentation are systematically developed following a seven-step approach:

- Defining users and their information needs.
- Conducting a preliminary investigation to sharpen content definition.
- Developing an annotated outline or strategic paper describing the structure and sequencing of the information to be presented.
- Information gathering: task and job analyses, taped interviews, review of existing documentation and so on.
- Writing or producing the material.
- Testing the material on the target audience prior to production, wherever appropriate.
- Revising the product based upon user feedback.

"They are introduced to users in one or more orientation sessions. During these sessions, trainees learn how to use the materials to acquire the information they need.

"One of our more recent experiences involves developing a totally coordinated program of structured training exercises, a user guide and computer-assisted course for nationwide use.

(Continued on Page 37)

READER COMMENTARY/Daniel Sobieski

Computer Model Wrong About Tax Cut's Effects

Lawrence R. Klein, Nobel Prize-winning economist, was quoted recently as saying that his computer-generated econometric model predicts President Reagan's tax-cut plan will not produce an annual long-term growth in gross national product (GNP), but rather will result in reduced tax revenues and increased deficits. "Nobel Winner's DP Model Disputes Reagan Tax Plan" [CW, July 20]. All his model proves is that if you put garbage in, you get garbage out.

He assumed that the economic pie is fixed in size, that people will use their extra money to buy rather than save, invest and enlarge the pie so that everybody's slice is bigger, including the government's. He assumes that demand will be increased, but not supply.

The key concept in the Reagan approach is the "marginal tax rate," the amount of tax a worker, or businessman, can expect to pay on the next dollar of income. This figure is different from, and generally much higher than, the average tax rate.

If the marginal tax rate is too high, the hour of work that might otherwise have been done, the business investment that might have otherwise taken place, will not occur. The affected individual will instead seek more leisure, refuse an extra hour or day of work, decline any employment at all, put his money into a tax shelter and so forth.

By lowering marginal tax rates — including the tax on capital gains — by 30% across the board, the Reagan plan would reduce the present bias against work and investment. It would also significantly expand the base — and ultimately total revenues — by making tax avoidance of both the illegal and legal varieties less profitable. Nor, despite the skepticism of its detractors, is the supply-side theory untested.

'Underground Economy'

Because of high marginal tax rates, more and more people have sought ways to avoid reporting income. There is a growing system of exchange for cash or barter, called the "underground economy," which provides no record of the transaction and thus escapes the net of federal and state tax officials. Prof. Peter Guttman of Branch College calculated that the underground economy jumped to nearly $265 billion in 1978, or from about 2% to 4% of the GNP in the '50s and '60s to 12.6% in 1978.

This tripling of the underground economy follows the increase in marginal tax rates. In 1965 only 7% of

(Continued on Page 36)

THE TAYLOR REPORT/Alan Taylor

Are Data Processing Specifications Obsolete?

The idea that a user must be able to tell in advance exactly what he would ever want, even though the resulting system may not be supplied for some months or years to come, became inbred into the data processing scene some 25 years ago and remains today. The specifications gap was one of the disadvantages of early business computer systems over punched cards and even manual systems.

The gap remains largely because of the problems imposed by the demand for specifications itself and also because of the very great likelihood that nothing other than a worked-over system design will ever be even marginally acceptable.

When complete specifications are required, if a system does not match the user's needs or expectations, the specification is the first line of both defense and attack. If the specification makes it clear that what has been provided is wrong — or worse, if the specification is silent on the point, outdated or nonexistent — then the user can successfully shuck the blame onto the systems people. Normally it has been quite unprofitable to do more than make nasty noises about the blame, almost as a ritual. The user still had to pay the systems people whatever it cost in money, time and system inconvenience. Still, the lesson was clear: Full, detailed specifications were necessary; their lack or incompleteness resulted in DP being able to be blamed for errors, so DP needed them. End of argument.

VA-Mumps Situation

This requirement, however, now shows signs of becoming obsolete. The real argument in the Veterans Administration vs. Mumps matter, Taylor Report, [CW, Aug. 3] illustrates an alternative to detailed specifications and one that may suit many users a lot better.

In systems such as Mumps or Forth, the operational progress *can* be safely modified while the system continues in operation. This new ability gives back much the same immediate response to user needs that was lost when punched cards were ousted by computers. Indeed, the whole idea of the Mumps design was to permit such modifications to be made in real-time — and within a doctor's level of patience. (Most of the VA analysts to whom I have talked seem to regard this as having been the greatest challenge, varying from a high of a couple of days, to a low of about 10 nsec.)

This concept of modifications, which is also used in Forth, drastically changes the type and use of specifications. Charles Moore of Forth, Inc. and inventor of Forth, comments that system building starts with only a broad, undetailed specification *and* the known capability to mold operational programs to the maximum capability of the hardware. This, he feels after 10 years of experience, is all that is needed. And that poses the question of the need for specifications quite squarely.

Role of Specifications

Aside from Mumps' and Forth's advantages when it comes to system development and modification, what about the role of specifications in procurement and system comparisons?

One of the weaknesses of both Forth and Mumps may well be in this apparent inability to be compared directly with the traditional systems. Similarly, one of the weaknesses of our early business computers was our inability to match the punched-card people's capability to produce just the report that was wanted immediately. In fact, it took almost two decades before the normal computer system had report-generation capabilities able to match those of the punched-card people — and punched cards had been defeated long before the report problem was solved.

So mere lack of a current solution to the full specification problem does not prevent specification obsolescence. It just shows that it applies to system production operations and not yet to the whole ball of wax. Currently, just the *detailed* specifications appear to be obsolete.

However, the current standard technique of developing computer systems is at least under question. But it is not defeated, by any manner of means; so far neither Mumps nor Forth has shown any great strength in gaining user acceptance. In fact, the arguments for and against detailed specifications have still to be completely formulated and published. All we have now are clear demonstrations of system developments that do not require them and lots of data about the cost, dangers and difficulties inherent in demanding detailed specifications.

That, however, is enough to start us wondering what the real alternatives are. Perhaps when we do get proper comparisons, we may find that the high cost of software which we so often hear about is really the high cost of writing — and the even higher cost of having to read, digest and understand — those detailed specifications, and not true cost of software at all!

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LETTERS

Astronomical Cost

I read with interest and dismay Robert Grauer's Reader Commentary concerning Cobol-81 conversion [CW, July 20]. Grauer calls the $500 million conversion estimate for the federal government "astronomical." I quite agree and it is because of this astronomical cost that I disagree with the Ansi Cobol-81 standard. Grauer implies that the use of an automated conversion tool — he uses CSA — will eliminate those costs!

As the originator of the "astronomical" estimate, I can assure him our estimate assumed an automated conversion aid would be used. No other approach would be practical. Grauer apparently believes that the acquisition of such tools, training in their use, preparing the computer runs, examining and testing the results and the required computer time are all provided free.

The availability of adequate conversion tools is not in question. Many firms will offer tools as soon as the standard is announced. Grauer ignores the tremendous cost to use those tools to convert the estimated 250 million lines of Cobol source code in the federal government. The estimate of both the number of Cobol statements as well as their cost of conversion is conservative in every respect. One need only check the costs charged by conversion firms to convert from Cobol-68 to Cobol-74.

John Caron
Director
Federal Conversion Support Center
Falls Church, Va.

DP Shortage Reflects Salary

Your article describing a general DP personnel shortage, "DP Shortage Hits Hardest in Metropolitan Locations," [CW, Aug. 3] quoted managers who said they had to interview until they were "blue in the face" to find qualified applicants. The article was misleading.

I know of no well-managed data center in the New York area that has any shortage of qualified personnel. There are many computer programmers, operators and systems analysts in this area who are available and "ready to go."

I've seen data centers that have had 100% turnover rates in two years. It was always poor management. I've known DP managers who couldn't find a qualified applicant. It was the low salaries.

Many DP managers choose to ignore the law of supply and demand. If a DP manager goes around New York trying to find gasoline for $1 a gallon, he will come to one of two conclusions:

- There is a gasoline shortage. Therefore, interview more gas stations.
- There is no gasoline for $1 a gallon. Therefore, offer to pay $1.40 a gallon. Interview more gas etations.

The DP managers at many big companies typically come to the first conclusion.

DP managers who offer what supply and demand require have access to all of the talented DP personnel they need in this city. My associates in my consulting business agree with me on this point.

Michael A. Van Dyk
New York, N.Y.

No DPer Shortage Here

I read with some diagust the article "DP Shortage Hits Hardest in Metropolitan Locations" [CW, Aug. 3].

Many of the DP managers and MIS directors *Computerworld* interviewed seemed to be more interested in the experienced people than in giving an entry-level person e chance to start a career in this field.

DP directors must realize that those already in the field must be eventually replaced. They'd better begin training those who have had technical school training, a two-year degree or e four-year degree to take their place and to ease the shortage, instead of going after only those with experience.

A suggestion might be to set up DP apprenticeship programs similar to those in other professions, like those of plumbers, electricians and carpenters.

But what ticked me off most was Wendell Carlson's comment that DP shops went "race-car drivers" not

(Continued on Page 37)

"Don't buy a PDP 11"

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"...With departmental budget cuts, high interest rates, hardware prices falling back, an upgrade down the road..."

"But I've always bought PDP11s. They're the best."

"I didn't say don't USE a PDP11 ...just don't BUY one!"

"Huh?"

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"That sounds great, but don't these rental schemes lock you in for 5 years?"

"No, not if you rent from HAMILTON. If you know you're never going to change so much as e terminal for 3-5 years, then go talk to your bank about e long term lease. But, if you want the flexibility of upgrading either all or any part of your system when you need to, then go talk to HAMILTON about rental. They'll listen."

"That's really interesting. I didn't know I had that kind of rental alternative."

"And what's more, you can talk to HAMILTON about their rental-with-purchase-option plan which gives you the right to buy the system when you're ready."

"But will DEC maintain my HAMILTON rental systems?"

"DEC maintenance is already INCLUDED in your monthly rentals. Plus, HAMILTON handles all the shipping and guarantees you e really smooth installation."

"HAMILTON certainly has a comprehensive rental program."

"Of course. They have more experience in renting DEC systems than anyone else, with thousands of installations in Europe and North America."

"You know, if they hadn't limited my department budget this year, I could have gone straight to e VAX 11/750. Hey. I don't suppose HAMILTON rents....."

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Operating System RT11 RSX11M RSTS/E VAX VMS CTS
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Model Wrong About Tax Cut's Effects

(Continued from Page 33)
taxpayers faced marginal income tax rates of 25% or higher; in 1977, more than 39% were in those high brackets. It must be assumed that the vast majority of these people are not criminals. Given lower tax rates, many of them would not seek to end-run the tax system. Inflated tax rates remove a large source of government income and encourage illegal activity.

As tens of millions of people find their income in or near the highest tax brackets, more and more are seeking legal ways to shelter income. Tax shelters are investments solely designed to reduce taxes. The drive to shelter income distorts market signals that direct investment into the most productive enterprises.

Twice since the income tax was instituted in 1913 Congress has enacted a broad-scale, across-the-board reduction in tax rates — in the 1920s under Presidents Harding and Coolidge, and in 1964-65 on the recommendation of President Kennedy. On both occasions, critics denounced the cuts in advance, predicting they would lead to a catastrophic drop in federal revenues. On both occasions, the critics were proved spectacularly wrong.

During the '20s, under prodding from Treasury Secretary Andrew Mellon, taxes imposed during World War I were drastically reduced. The result was one of the most prosperous decades in American history. Real GNP rose 54%; output per man-hour rose 66.5%. There was a $410 million increase in tax revenue and a $9.3 billion decrease in the national debt.

Part of its success simply reflected increased wealth generated by a growing economy. Part came from a reduction in tax avoidance and less diversion of income from productive investments toward nonproductive tax shelters. By 1925 taxes paid by those with incomes of more than $500,000 had more than doubled. By 1928, taxes paid by the $100,000-plus class were larger than the total income tax revenues in 1923 and 1924.

History repeated itself with the Kennedy tax cuts. Total revenues to the Treasury increased from $48.2 billion in 1963 to $49.5 billion in 1965. Taxes paid by those making more than $1 million annually nearly doubled. Unemployment dropped by nearly half from 1961 to 1969. The weight of experience is on the side of Reagan and the supply-siders. Significant reductions in marginal tax rates do stimulate work, savings and investment; and they do enlarge the tax base.

Tax Cut Increased Savings

Following the JFK tax cut, savings grew by 118% in the years from d1963 to 1967, the fastest growth in modern history. The savings rate shot up by 60%, from 4.7% to 7.5%. In constant dollars, we went from an average annual savings growth before the tax cut of minus 1.4% to plus 19%.

The Capital Formation Council estimates that two-thirds of our total (national) personal savings now comes from the 5% of all income earners who make more than $50,000 a year. Reducing the marginal tax rates would benefit most those who save the most. But it would benefit the rest of us as well. As President Kennedy observed, the rising tide of investment would raise all boats. Other examples abound. In 1978 the maximum capital gains rate was reduced to 28%, an 11.3% increase in new incorporations.

Economic models that do not understand the way the world works and what motivates individuals to work, models that ignore proven historical example of supply-side success, are no more effective than a wizard consulting the entrails of a chicken.

It is a simple truth that when you allow an individual to keep more of the fruits of his labor, there will be more labor and more fruits. And the bigger the economic pie, the bigger everyone's slice, including the government's.

Sobieski is a senior systems analyst with Pollenex, Associated Mills, Inc., in Chicago.

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*Among independent 3270-compatible equipment suppliers, according to International Data Corporation.

LETTERS

(Continued from Page 34)

"mechanics." Doesn't he realize that someone had to give him a chance at the beginning of his career? I think DP managers had better rethink their experienced-only stance.

I'm getting tired of not being able to get a job as a programmer or even as an operator because those jobs require one, two or five years' experience, and this has been going on for six years!

K. Keene, A.S.
Pompano Beach, Fla.

Hard Lesson

Some "bloopers" are just too much to smile at and let pass. "Firm Learns Hard Lesson in Mini Buying" [CW, Aug. 3] included a picture showing the chairman of the company, according to your caption, "loading a tape reel onto a disk drive." Now, that *is* a hard lesson!

And what is the meaning of a tape-to-disk utility in such an installation?

I am encouraged to see the article has a happy ending and that the user is successfully using the new system. But I cannot help but wonder if before scrapping the first system they remembered the prime rule in hardware diagnostics: Check that a coffee pot is not plugged in in place of the console.

Sam Lepore
Poughkeepsie, N.Y.

Tape/ Disk Mixup

I can understand why "Firm Learns Hard Lesson in Mini Buying" [CW, Aug.3] when it shows a picture of a man leaning over a peripheral unit accompanied by the caption: "Believing that even the chairman of a company should know how to start a computer, Robert Wolff practices what he preaches by loading a *tape reel* onto a *disk drive*."

Marvin Goldstein
Astradyne Computer Industries
Garden City, N.Y.

Try That Again...?

I agree "getting burned in the selection of a minicomputer system is easy when you are relatively unsophisticated about business automation . . . " [CW, Aug. 3].

It is also easy to write poor minicomputer articles when you are not technically knowledgeable.

Ray Johnson
Vice-President
Boudreau Computer Services, Ltd.
Hopkinton, Mass.

More On Training

(Continued from Page 33)

"The modular user guide includes step-by-step procedures for entering and receiving data and handy pull-out sections for easy reference.

"Employees were given the guide and introduced to the system during an orientation day. They sat at terminals and participated in a series of structured exercises under the direction of a trainer. Each time users performed transaction exercises, they first turned to the page in the user guide which detailed the procedure and the expected response.

"Although the user guide was field tested and revised, users are still encouraged to give their suggestions and opinions for subsequent revisions.

"Finally, to ensure that users have access to consistent and professional instruction any time they need it, we are developing a computer-assisted course for on-the-job use. When completed, users who require remediation or review or new hires who require initial training can obtain it while sitting at their desks. The course should have been available upon initial installation; however, it will still serve an important training function."

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It's the brand new HP 2622 block mode terminal from Hewlett-Packard.

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But the HP 2622 is more than just a flashy screen personality. It has a typewriter-style keyboard with separate numeric keypad for quick and easy data entry; eight user-definable soft keys; self-diagnostics for high reliability; even an optional built-in thermal printer for hard copy at the touch of a key.

See how good your system can look with the HP 2622. For an eye-opening demonstration, call your local HP sales office listed in the White Pages. Or return the coupon to Hewlett-Packard, Attn: Tom Anderson, Dept. 398, 974 East Arques Avenue, Sunnyvale, CA 94086.

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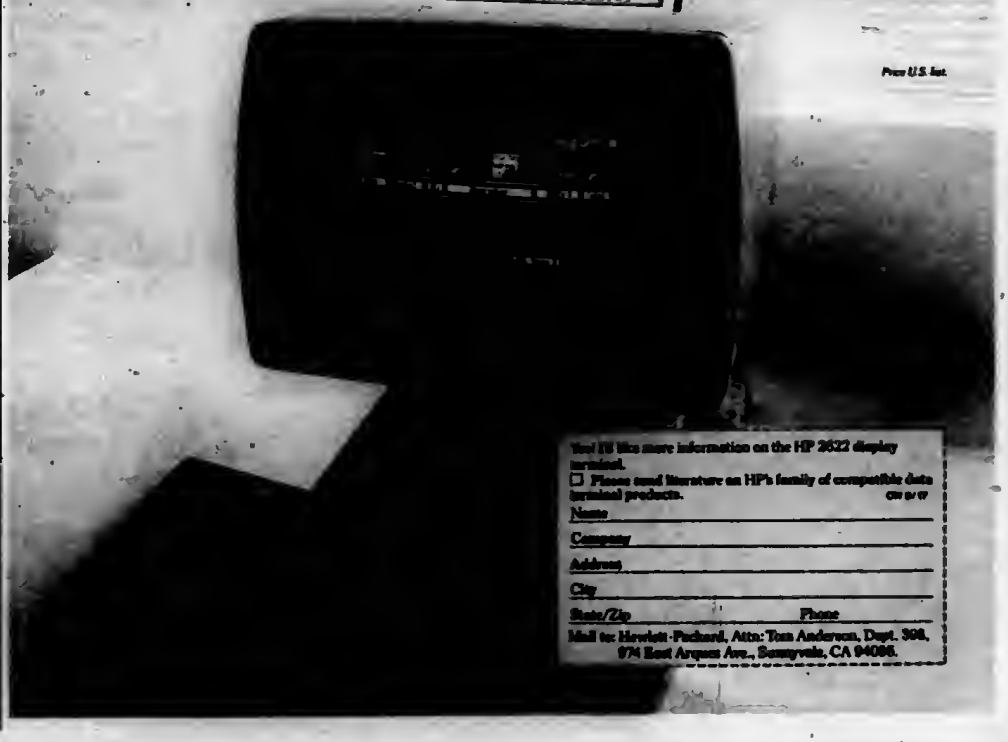

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Oh, the joys of being a dp professional.

Every job has its share of problems, but dp professionals seem to have been blessed with more than their fair share.

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We understand the frustrations, the irritations, the agonies of runs gone awry.

For years, we, as users ourselves, shared your joys: the pleasure of hearing hardware vendors insist there is no cure, and the delight of dealing with software houses insisting they had the cure-all.

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It was from the impossibilities of such extremes that an extremely novel idea took form:

Form a new kind of software company. A company comprised of knowledgeable individuals who really know the problems on the inside. Add to that equal amounts of time, talent and backing, and you can produce software that solves the problems.

Our name is Triangle Software Company. And our corporate logo itself reflects our corporate commitment: we will focus all our efforts, from all sides, on solving the problems inherent in software that is supposed to be the solution.

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[1] Documentation available from Triangle Software Company

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'Ramis II' The Answer

DPers Teach Users Basics of Reporting

SEATTLE — Data processing personnel of the county transportation agency here are helping their users help themselves by training them to use a software package to produce reports.

Barbara Fogie and Romell Reed of the Municipality of Metropolitan Seattle's (Metro) computer services division have prepared a course to help nonprogrammers in their agency's divisions obtain data from the computer files.

The software package they are using is Mathematica, Inc.'s Rapid Access Management Information System (Ramis II).

While searching for a data management package several years ago, Fogie and Reed surveyed a number of products including Software AG's Adabas and Pansophic Systems, Inc.'s Easytrieve.

They already had been using Applications Software, Inc.'s Asi-st data management and reporting system. The problem was that Asi-st is a procedure-oriented language that required the filling out of forms to produce reports, Reed explained.

"With Ramis, you just write English-like words and it is kind of free-form," she said.

Ramis was chosen because "it is so easy to come up with reports and graphs and it is data management, too. It seemed to cover all of our needs," Reed added. The course she and Fogle prepared was designed to enable employees to get information rapidly on their own instead of waiting for computer services personnel to prepare reports during regular production schedules.

It took two months to develop the course, particularly since they decided it was necessary to find examples that were realistic to functions at Metro. Recently, 40 employees went through the class in three, one-week sessions.

Four Areas

The course is divided into four areas. The students first learn what data is stored in which of the 600 production files in Metro's computers, which cover the county's transportation system as well as water quality and pollution divisions. Next they learn how to plan report formats. Metro vehicles needing maintenance, for example, may be listed by vehicle number, base location, type of repair needed or another form of classification.

In part three the students learn about the actual Ramis language. Finally, they are taught how to get their Ramis requests into the computer system to produce reports.

The Metro computer center employs a Prime Computer, Inc. 300 Series minicomputer and a network of IBM, Perkin-Elmer Corp. and Courier Terminal Systems, Inc. terminals. These communicate with the IBM 3031 mainframe at the King County government computer center where Metro shares computer time.

The response to the Ramis training has been good, Reed said. "Just with a couple days of training they can use our files and get out real quick reports," she added.

The students complete several practice reports in class and then actually solve two problems themselves, using the system to produce reports. To date, classes have been scheduled on the basis of demand. Reed said she expects to be starting another class, probably in October.

Panexec Library Aimed at 370 Users

OAK BROOK, Ill. — Pansophic Systems, Inc. announced a release of its Panexec Library Control System for users of IBM 4300 and IBM 370 mainframes running under DOS/VSE AF2 and AF3 operating systems.

Panexec DOS/VSE 1.0 reportedly includes management and control of executable programs, a source to executable tie, transparency of use, Easytrieve reporting facilities, shared direct access storage device support backup and archival core image library conversion.

Panexec is intended to provide a controlled storage library for IBM and user-created executable phases and object modules. It also is said to include facilities for maintaining object modules and executable phases without affecting the production environment.

Panexec DOS/VSE 1.0 is priced at $12,500, Pansophic said from 709 Enterprise Drive, Oak Brook, Ill. 60521.

'OLM' Defines Screen Layouts

WESTWOOD, Mass. — Cullinane Database Systems, Inc. announced the release of its On-Line Mapping Facility (OLM), a utility program designed to help define its IDMS-DC data base management system screen layouts.

OLM reportedly enables programmers to compose or modify IBM 3270 screen layouts interactively at an IDMS-DC terminal. The resulting map is stored in the Integrated Data Dictionary and all relationships to relevant data base information are automatically resolved.

The software is said to reduce the manual coding of screen formats and allow the map designer to see the map taking shape while proceeding through the design process.

OLM is available to Cullinane IDMS-DC users at no extra charge, the vendor said from 400 Blue Hill Drive, Westwood, Mass. 02090.

Finance Managers Get Time-sharing

WILTON, Conn. — A financial management system designed specifically for corporate finance managers that will be available on its time-sharing network was introduced here by National CSS, Inc.

Known as CSS/Final, the package reportedly features modeling, analysis, data management and reporting capabilities. More than 80 mathematical, time series and financial functions are embedded in the system, the vendor said. The package also provides a facility for generating a variety of report formats that are either scheduled or on a one-time basis and include a graphics facility.

Possible applications for CSS/Final are said to include investment and cash management; sales and revenue forecasting; time series analysis; lease analysis and consolidation reporting.

Access to CSS/Final is available by telephone dial up via National CSS's remote computer services network. It is priced on a per transaction basis, the vendor said from 187 Danbury Road, Wilton, Conn. 06897.

CW Reports IBM's RMF & SMF Insufficient. QCM Needed!

5/11/81...At NCC, Michigan Bell's Phillip F. Curtiss claimed, for capacity planning, "IBM's RMF & SMF based systems don't offer enough information...to make accurate predictions on future CPU utilization." Also, "I/O utilization is equally important as CPU."

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SPI-Systems Performance Interrogator: An online performance and analysis facility for operator and TSO consoles Contains powerful exception reporting facilities

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CW176

Without Using JCL

Package Runs IBM Utility Duties

PALO ALTO, Calif. — A software product that reportedly allows users to perform IBM utility functions without having to use Job Control Language (JCL) was announced here by Softwarehouse Corp.

The new product, called Utility Interface, runs under the IBM MVS operating system. It reportedly permits the user to perform common utility functions such as print, punch, copy, move, unload, load, backup and restore. It also labels tapes, lists Volume Table of Contents, display catalog information and display Partitioned Data Set Directories without the need for preparing JCL and utility control statements.

Utility requests are performed using Utility Interface commands that select the utility, allocate all required data sets, build the utility control statements, invoke the utility selected and monitor the results, the vendor said.

Sequential, indexed sequential, partitioned and Virtual Sequential Access Method data sets are supported, as are generation data groups, according to Softwarehouse Corp.

The utility functions performed are said to maintain compatibility with standard IBM utility usage.

Utility Interface is available under a variety of licensing terms including a perpetual one-time license for $10,000. The vendor is located at 1000 Elwell Court, Palo Alto, Calif. 94303.

IBM MVS Users Get 'Top Secret' Package

VANDALIA, Ohio — CGA Software Products Group, Inc. announced a resource-protection security package called Top Secret for IBM users operating in MVS environments.

The package reportedly addresses the security needs of MVS installations by providing protection of resources including TSO, CICS, Network Communication Control Facility and the IMS data base management system jobs submitted through batch.

Another feature is comprehensive auditing capabilities that log the activities of individual users and the accesses to all resources, the user explained.

Top Secret is said to use the standard MVS security interface and to therefore be independent of changes to the operating system. The vendor said it requires only one I/O to its Security Data Base per user session, and that is for logon.

It reportedly requires no Initial Program Load or Job Entry System cold starts for installation.

Using Top Secret, the security administrator defines users and the resources they are allowed to access.

The software package is available for a monthly rental of $700 per CPU and will be ready for general distribution by the end of September, the vendor said from 212 W. National Road, Vandalia, Ohio 45377.

Query Package Unveiled For Vsam, Adabas Users

WALTHAM, Mass. — Artificial Intelligence Corp. (AIC) announced Release 102 of its Intellect Query software package, which includes data base versions for use with Software AG's Adabas data base management system and IBM's Vsam.

The English-language query package also is said to include IBM CICS interfaces for all Intellect versions.

Enhancements to Intellect include a series of ranking processes for comparisons, subtotal and percent-of-total that present results in descending order of magnitude, the vendor said.

Other new processes reportedly provide the user with a choice of vertical or horizontal output formats and the ability to ask for the top or bottom "n" items.

Intellect now handles multiple-valued fields, automatically scales values transmitted between the data base and the user and provides statistics and diagnostic aids to help the user maintain lexicons, the vendor said.

Intellect is available for perpetual lease for between $47,000 and $62,000, depending on the configuration. OEM pricing also is available, AIC said from 200 Fifth Ave., Waltham, Mass. 02254.

Generator Added to 'Rtfile'

BETHESDA, Md. — International Computing Co. added a report generator menu option to its Rtfile relational data base management system for users of Digital Equipment Corp.'s systems operating under RT-11 environments.

Called the Report Documentation Utility, the feature is intended for auto-documentation of report specifications and formats. It reportedly provides a description of the data bases, relationships and control modules used to produce a report; the physical dimensions; the placement of data items within each printed record; and totaling options.

The single-copy price for Rtfile is $2,500, including the report generator, display generator, transaction processor, data base definition utility, data manipulation utility, sort and selection executive and applications interface. More information is available from International Computing Co. at 4330 East-West Highway, Bethesda, Md. 20814.

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Cambridge Systems Group Enhances 'ASM2' Package

LOS ALTOS HILLS, Calif. — The Cambridge Systems Group has added support for IBM 3380 disk drives and the IBM DF/DS (indexed Volume Table of Contents) program product to its automated space management system, ASM2.

Other enhancements to the ASM2 software are an improved interface to IBM's RACF security package and additions to ASM2's pattern masking facility that reportedly allow an installation to select data sets that meet certain specifications and thereby eliminate redundant reports.

The user may define multiple levels of criteria, the vendor said, using "if-and-or" logic to produce only those reports he wants in the format he wants.

The enhancements to the ASM2 package are available as part of the basic price of $17,500, the vendor said from 24275 Elise, Los Altos Hills, Calif. 94022.

Hastech 'HS40' Fits PDP-11/34

MANCHESTER, N.H. — A newspaper financial and circulation management system that uses a Digital Equipment Corp. PDP-11/34 minicomputer and Basic Plus has been developed by Hastech, Inc.

The HS40 Series Business and Circulation System can be used in conjunction with the firm's HS40 Series Production Systems or in a stand-alone version. The two key functions of the package are its Financial Management System and its Circulation Management System.

The stand-alone system with computer, four VT100 terminals, controller with two 80M-byte disk drives, magnetic tape drive and controller and business software costs $172,000 from the firm at 670 N. Commercial St., Manchester, N.H. 13103.

System/34 DPers Get Cassette Course

WOODLAND HILLS, Calif. — A self-paced audio cassette course for IBM System/34 programmers is available from Automated Training Systems, Inc.

The System/34 Workstation RPG II Design and Coding course covers such topics as workstation file RPG specifications, S&D specifications, SDA mechanics, multiple screens, SRT RPG program cycle, LDA and external switches and read-under format.

The 40-hour course consists of 12 cassette tapes and illustrated workbooks. Single copy price is $595 from the firm at 21250 Califa St. No. 107, Woodland Hills, Calif. 91367.

ADR Adds Raw Data Sort Feature To On-line ETC WP Package

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) unveiled Release 1.5 of its On-line ETC word processing software package, which it said provides full support under its Vtam Roscoe terminal system.

The primary user-level enhancement, ADR said, is the Raw Data Sort feature, which allows users to sort raw data on-line before the composition step for a document.

The user reportedly can insert sort keys into the first of the raw data records and, assuming that the records have the same format, On-line ETC automatically sorts all the records based on that first model.

Other enhancements include support for the IBM 6670 laser printer, the IBM 3278 Model 5 terminal and the IBM 3279 color terminal; a selective backup facility; an off-line facility for merging multiple backup data sets; the ability to carry document attributes in the on-line library; and a new terminal request for modifying these characteristics.

These features are supported under Vtam with Roscoe Release 5.OA and Btam Roscoe aites will have most of the features available to them, ADR said.

The permanent license price for On-line ETC is $13,500 for DOS and $16,000 for OS operating environments, the vendor said from Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

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'Daszl' Helps Solve Problems In IBM MVS Environments

FALLS CHURCH, Va. — A software tool kit designed to prevent, diagnose and resolve problems in the IBM MVS environment was announced here by Potomac Software Labs, Inc.

Daszl, as it is called, is a comprehensive integrated package of more than 60 functions for conversions, tuning, user support, training and crisis resolution, the vendor said.

The software reportedly permits search, display and update of any data on direct-access storage or in virtual memory, regardless of format. Data may be specified by address, contents or key word.

Daszl is designed to detect hard or soft I/O errors, repair control blocks, data bases, keys and program instructions, perform disk maintenance, and verify and rework Program Temporary Fixes. Also included are a variety of performance, diagnostic and debugging aids. Users reportedly can display and analyze more than 50 system control blocks and information on active tasks, errors in system data sets, status of TSO lines and resource shortages.

Daszl runs in 64K bytes under TSO, initiator or started task control with teletypewriter and full-screen IBM 3270 support. A permanent, single-CPU license is available for $8,000 from Potomac Software Labs, Inc., 7304 Burroughs Lane, Falls Church, Va. 22034.

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CW07

Automated Tool Out for Cobol

NEW YORK — A software enhancement tool for Cobol program code standardization was introduced here by The Productivity Group, Inc.

Called Enforce, the package is an automated tool for program code evaluation and modification, standards enforcement and maintenance through the application of standard vendor and user-supplied Cobol coding rules and conventions, the vendor said.

It reportedly can be used to convert program code to the new Ansi Cobol-80 standards.

Enforce is available in source code form with accompanying user manual and installation procedures for $2,995 from The Productivity Group, Inc., Suite 1140, 373 Fifth Ave., New York, N.Y. 10016.

Course Offered In Data Base Design

HOUSTON — "Structured Data Base Design," a five-day course intended to simplify the transition from logical design to physical design, will be offered by Learmonth & Burchett Management Systems, Inc. in New York City, San Francisco, Houston, New Orleans and Steamboat Springs, Colo., at various times of the year.

The course methodology reportedly consolidates the published techniques of data base pioneers such as Bachman and Codd and develops them into a practical, rule-based series of steps for the production of physical data base designs, the firm said.

The course is said to incorporate a step-by-step method for generating "first cut" physical designs that conform to the architecture of the particular data base management system (DBMS) in use.

Rules are available to produce designs for IBM's IMS; Cincom Systems, Inc.'s Total; Software AG's Adabas; and Cullinane Database Systems, Inc.'s IDMS, the developers said.

The five-day course costs $900. Further information and schedules may be obtained from Learmonth & Burchett Management Systems, Inc. at Suite 320, Dresser Tower, 601 Jefferson, Houston, Texas 77002.

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Used in conjunction with ADABAS — Software AG's award-winning data base management system — NATURAL meets the needs of today's most demanding DP centers. In fact, NATURAL has proven itself so effective that in many installations it has become the primary applications language.

If you'd like to know more about NATURAL, just fill in the coupon, and mail it today. We'll show you how to give your programmers an unbeatable 10 to 1 edge in new applications development, starting right now.

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*VAX and VT100 are trademarks of Digital Equipment Corp.

Software/Services Directory Available for Burroughs Systems

AUSTIN, Texas — The BWI Software Library, a directory of software and services available for all Burroughs Corp. computer systems, was released here by BWI, Inc., a cooperative of Burroughs users.

The service is reportedly a consolidated, single source of information on software offerings from Burroughs, software houses and users. It also profiles firms engaged in computer-related services, BWI explained.

The library organizes software profiles by line of business. An additional section, "Computer Related Services," contains profiles of service offerings to Burroughs users, according to BWI.

This section includes services such as consulting, conversions, custom programming, disaster planning and recovery, documentation, facility management and training.

A subscription for the BWI Software Library costs $140/year and this includes the directory itself in a three-ring binder and quarterly updates.

Further information can be obtained from BWI at Suite 301, 7600 Chevy Chase II, Austin, Texas 78752.

Activity Distribution Model Added to RCA 'Price' Family

CHERRY HILL, N.J. — RCA has added an activity distribution model to its Programmed Review of Information for Costing and Evaluation (Price) family of time-shared services.

Price-A is said to provide projections and evaluations of the time-dependent resources that are needed to carry out scheduled projects, programs and support activities. The model is self-documenting, self-prompting and has a tutoring function.

Price-A is free of charge to purchasers of either Basic Price, for determining hardware acquisition cost ($35,000), or Price-S, for software cost ($35,000). Other models in the family are Price-L, for hardware life cycle cost ($7,000, sold only with Basic Price) and Price-SL, for software life cycle cost (free with Price-S), the vendor said.

RCA is at Building 206-I, Rt. 38, Cherry Hill, N.J. 08358.

CSCI Offers Time-sharing Service For R&D Needs of Businesses, Engineers

CHESTNUT HILL, Mass. — Computer Software Consultants, Inc. (CSCI) has announced a time-sharing service geared to the research and development needs of technical businesses and software engineers.

It offers VAX Fortran, Basic, Cobol, Oregon Software's Pascal and a variety of text editors, all with technical support from CSCI's in-house software engineers, Computer Software explained.

Under the first of three pricing schemes, heavy prime-time (8 a.m. to 6 p.m.) users pay $630/mo and receive exclusive use of a computer port, unlimited connect time, 2.5M bytes of disk storage on-line and 100 free CPU minutes.

The second pricing scheme costs $50/mo, offers five prime-time hours, 1M bytes of disk storage on-line and 15 free CPU minutes, the company said.

The third off-prime scheme costs $20/mo and offers 20 hours of non-prime connect time, ½M of disk storage on-line and 10 free CPU minutes, CSCI said from 200 Boylston St., Chestnut Hill, Mass. 02167.

'QCTAB' Cuts Clerical Preparation Time For Five-Dimensional Cross-Tabulations

LOS ANGELES — A report program generator execution time, parameter-driven tabulation program that allows users to prepare a five-dimensional statistical cross-tab in less than 30 minutes of clerical effort is available from Administrative Planning and Support.

With QCTAB, cross-tabulations are presented in matrix form and allow up to 12 columns and up to 99 rows per matrix; up to three matrices per subreporting level and up to four lines of report and column headings. Data is tallied from a specific data field in each record or by observation counts. Data records may have weights to be applied to an accumulative field or to record counts (that is, weighted sample survey or inventory extension).

The software costs $3,200 if installed by the vendor or $2,500 if installed by the customer, the company said from Suite 205, 3870 Crenshaw Blvd., Los Angeles, Calif. 90008.

'Tacs' Group Insurance Administration Runs on Ultimate Corp. Minicomputer

NORTH ALPINE, Utah — A complete system for group insurance administration packaged with an Ultimate Corp. minicomputer has been announced by R.E. Wilcox Systems, Inc.

The Total Automated Claims System (Tacs) was designed to handle all major functions of group insurance administration including billing and accounting for medical, dental, vision, prescription, drugs, life and disability group insurance.

Plans are defined using tables of adjudication steps and associated parameters that allow full automation of any plan, the vendor claimed.

Tacs is priced at $75,000 including installation plus a $500 monthly maintenance fee from R.E. Wilcox Systems, Inc., 134 E. 200, N. Alpine, Utah. 84003.

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GRAHAM MAGNETICS

Cobol System Unveiled For TI Computers

ROUND ROCK, Texas — A self-contained, multiuser Cobol system for Texas Instruments, Inc. computers has been announced by Ryan-McFarland, Inc.

In mapped hardware versions, COS990 supports up to 60 terminals and 50 nonterminal processes with over 40K bytes of memory for each user program and with 64K bytes of memory in unmapped configurations, the company said.

The system features a flexible job description language that provides for synonym value substitution, the vendor said.

The COS990 system is priced at $3,500 and is available immediately from Ryan-McFarland, Inc., 2111 N. Mays, Round Rock, Texas 78664.

For BSC Networks

Release Upgrades Comten Tool

ST. PAUL, Minn. — Release 1.0 of the Comten Multiple Access Facility 3 (MAF3) provides increased flexibility and efficiency of IBM Binary Synchronous Communications (BSC) 3270 networks for users of Comten, Inc. 3600 communications processors.

A 3600 system control licensed program product, the software was designed and implemented under NCR Corp.'s Communications Network Architecture.

MAF3 provides increased host accessibility from BSC 3270 devices, both local and remote, for users of Comten 3650, 3670 and 3690 communications processors, the vendor said.

It also provides capabilities to switch a single BSC 3270 device or combination of BSC 3270 devices on a cluster controller to any host application program using emulation access methods.

It can also improve efficiency in the host processor by placing the 3270 polling functions in the 3600s closest to the cluster controller. MAF3 provides the functions and features of previous MAF releases and resides in the communications processor in both a front-end and remote communications environment.

The product licenses for $108/mo or $1,188/year, Comten said from 2700 Snelling Ave. N., St. Paul, Minn. 55113.

'Maps' Gets Macro-11

ELM GROVE, Wis. — McHugh, Freeman and Associates, Inc. has unveiled a Macro-11 version of its Menu Authorization Processor and Application Security System (Maps) for RSTS/E sites.

The package features installation without modification of existing applications and authorization of users by single programs, entire menus or all applications controlled by Maps.

Currently available only to RSTS/E sites using Digital Equipment Corp. VT Series CRT terminals, the package costs $3,500 from the firm at 1135 Legion Drive, Elm Grove, Wis. 53122.

'EZ-List' Update Fits System/34

E. WILLISTON, N.Y. — Productive Software Systems, Inc. has announced an enhanced version of EZ-List, its two-part package for the IBM System/34 that writes RPG II report programs through user responses.

The new version generates full RPG report programs with capabilities of up to five files accessed in one report.

The EZ-List package is priced at a one-time license fee of $1,450 from Productive Software Systems, Inc., 27 Atlanta Ave., E. Williston, N.Y. 11596.

Think what your programmers could do if your users did their own reports.

Answer/DB, the latest Implementation System from Informatics, is the new on-line software tool for report generation. It lets non-DP people develop their own report requests at a terminal — in an English like language — with as few as four simple statements.

That means much faster report turnaround, wider smiles from non-DP people in your organization, and greatly increased programmer productivity.

Answer/DB has made old-fashioned batch reporting systems obsolete because it's designed to handle the problems you'll be facing in the data base and data communications world. Answer/DB operates with your standard OS/DOS files and IMS data bases. And it offers completely interactive, on-line query entry with syntax checking and editing capabilities for creating error-free report requests.

For more information on Answer/DB and other information retrieval systems, just complete the coupon. Or, call us at (213) 887-9121.

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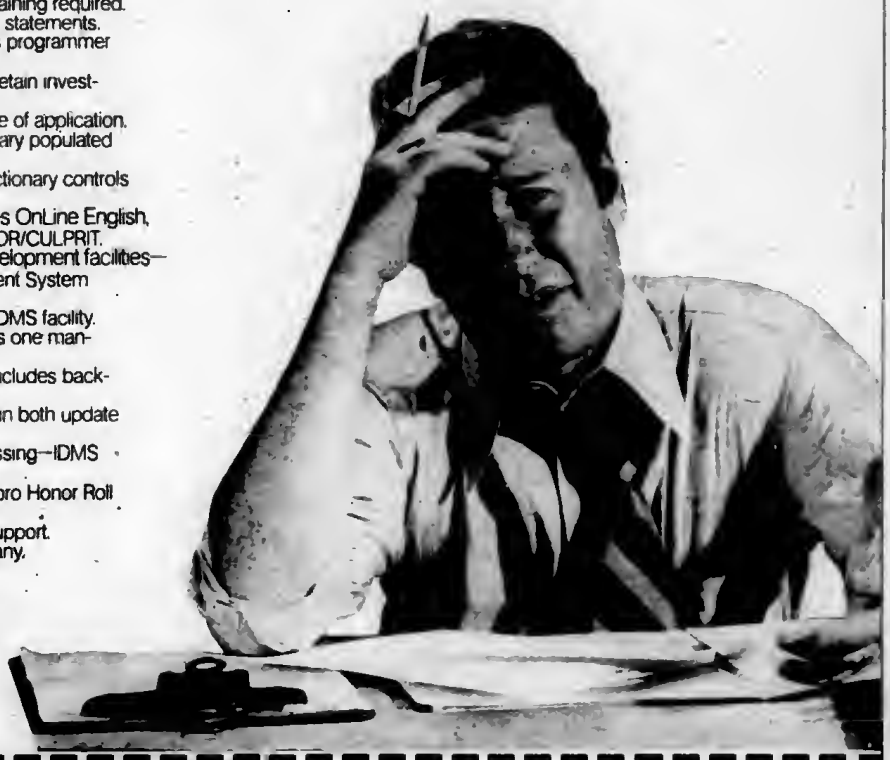

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'FAS' Responds To Forecasting

DALLAS — Corporate Time-Sharing Services, Inc. is offering a financial forecasting system designed to respond to a recent Security Exchange Commission proposal that would require publicly held corporations to announce anticipated future revenue and earnings.

The Financial Analysis System (FAS) is said to permit users to develop best, worst and likely cases using a forecasting method best suited to the corporate client.

The system works on an interactive basis via a telephone line connected with the firm's computers. Pricing is on an as-used basis. The firm is located at S. Tower, Suite 805, 2720 Stemmons Freeway, Dallas, Texas 75207.

'FDR' Revision Cuts System Time

CLIFTON, N.J. — Innovation Data Processing, Inc. has released a new version of its Fast Dump Restore (FDR) package that is said to feature 10% to 30% reduction in elapsed time, 50% to 80% reduction in CPU time and reduced channel contention.

Other features of Version 4.5 include support for Data Facility/Device Support (Indexed Volume Table of Contents), DASD Error Recovery, FDR and data set functions that dump up to 40 disk packs in one execution.

The software costs $4,500 for one CPU. Innovation Data Processing is located at 970 Clifton Ave., Clifton, N.J. 07013.

Package Ties Kodak to IBM 5100

ROCHESTER, N.Y. — Eastman Kodak Co. is offering a software package that makes the Kodak IMT microimage terminal plug-compatible with the IBM 5100 series of computer systems in order to provide users with electronic filing capability on a turnkey basis.

The program is the first commercially available package to match the IMT microimage terminal, or any other auch terminal, with the 5100 series, the firm claimed.

Written in IBM Basic language, the software can perform electronic filing tasks auch as English text prompts and messages, menu-driven program functions, error messages and prompted screen formats.

The electronic filing package is not sold as a joint venture between Kodak and IBM. The software costs $3,000. Total costs for the package including all hardware and Image-Link I program is around $30,000.

More information is available from the firm at Department DP-1040, Business Systems Markets Division, Eastman Kodak, 343 State St., Rochester, N.Y. 14650.

Comshare's 'Site II,' 'Site.Potential' Available on Time-sharing Basis

ANN ARBOR, Mich. — Site II, a demographic information retrieval system, and Site.Potential, a sales potential reporting system, are now available on a time-sharing basis from Comshare, Inc.

Site II and Site.Potential provide access to demographic, income and sales potential information that can support analyses related to site evaluation, market entry planning, market share analysis, promotional planning and other applications.

Site II can create reports on demographic and income information including historic, current and projected figures for any area of the U.S. Site.Potential can run reports that measure U.S. consumer spending.

When charged by report, the cost ranges from $25 to $85. In a licensing option, as many reports as required can be generated at a cost of $3,300/mo for a three-month license period or $1,300/mo for a 24-month licensing period. Comshare is at 3001 S. State St., Ann Arbor, Mich. 48106.

I-Concepts Offers 'Assitar' for Series/1

DALLAS — I-Concepts, Inc. has announced Assitar, a report writer for IBM's Series/1 line of processors.

The menu-driven package offers arithmetic functiona, optional record selection, automatic totaling of columns, page numbering, directories and direct reporting to terminals or printers, the vendor said.

The package runs on the Series/1 EDX operating system Release 1, 2 or 3 and IBM's $IAM. It costs $1,250, the vendor said from Suite 228, 2560 Royal Lane, Dallas, Texas 75229.

THE AJ 833.

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The STD 1600 is the solution to sending and receiving problems.

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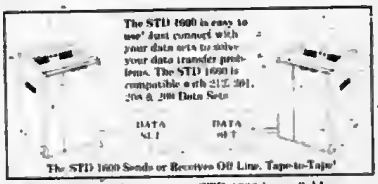

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Data Bits

CDC Ties Cybers to Public Nets

MINNEAPOLIS — Control Data Corp. is offering an access method that links its Cyber series computers together over public packet-switched data networks.

The 255X Network Processing Unit front end eliminates the cost of fixed leased lines or long-distance calls and meets international standard X.25 and packet assembly/disassembly procedures, the vendor said.

The 255X costs between $40,000 and $60,000, depending on computer configuration, the vendor said. CDC may be contacted through Box O, Minneapolis, Minn. 55440.

Converter Emulates IBM 3270s

AUSTIN, Texas — KMW Systems Corp. has unveiled a protocol converter that allows users to attach a variety of Ascii asynchronous CRT terminals and printers to an IBM mainframe using IBM 3270 subsystem emulation.

The Series II 3270 Full Screen will support from one to eight CRT terminals or printers at data rates from 150 bit/sec to 19.2K bit/sec.

The 3270 screen emulation is handled by a set of tables that take into account the cursor control and keyboard functions available on the particular terminals being used.

The price of the unit is $4,750, KMW said from 8307 Highway 71 W., Austin, Texas 78735.

Concentrator Works 24 Channels

MANSFIELD, Mass. — Telecommunications, Inc. has unveiled an intelligent concentrator/multiplexor allowing up to 24 input channels of asynchronous data to be transmitted using the X.25 Level III protocol.

The Model 5000 TC features user command language, intelligent echoplex and the allowance of up to 24 user ports or terminals to share a single data link.

Data channels are individually programmable for throughput delay, priority, bit/sec rates up to 19.2K bit/sec, five to eight level codes, flow control method and parity. The 5000 TC starts at $2,500, the vendor said from 160-162 Main St., Mansfield, Mass. 02048.

CCI Front End Designed to Rival IBM 3704, Memorex 1270 Units

TORRANCE, Calif. — Computer Communications, Inc. (CCI) has unveiled a basic emulation processor designed to be competitive with the IBM 3704 or Memorex Corp. 1270 communications controllers.

The CC-6 uses a trim-line version of CCI's Network Communications System software. It supports one or two host computers (IBM 370 or compatible) and up to 32 communications lines (asynchronous/Binary Synchronous Communications (BSC)/mixed) at up to 9,600 bit/sec, the vendor said.

From one to four of the 32 lines may be wide-band at up to 56K bit/sec. Other features include mixed terminal/protocol support, terminal translation, auto-dial/auto-answer, automatic bit/sec rate detection and code conversion.

Line support upgrades from two to 32 lines are accomplished by printed circuit board additions. System growth is accommodated by a field upgrade to the vendor's CC-8 Enhanced Communications Processor, which offers support for up to 240 lines and four host computers.

Other CC-8 enhanced features include a flex disk, four-color supervisor/monitor console, terminal-initiated application selection, real-time trace line and X.25 support.

CCI offers monthly rental, and two, three, four and five-year lease and purchase for the CC-6. For example, a CC-6 supporting four asynchronous lines would rent for $1,100/mo; eight lines (four asynchronous, four BSC) would be $1,300/mo and 16 lines (eight asynchronous, eight BSC) would be $1,400/mo.

The purchase price ranges between $29,220 for the four-line version to $37,410 for the 16-line version, CCI said from 2610 Columbia St., Torrance, Calif. 90503.

Q1 Gives Model 68000 Communications Ports

HAUPPAUGE, N.Y — Q1 Corp.'s Model 68000 computer now incorporates 19 RS-232 ports for synchronous and asynchronous communications to 19.2K bit/sec.

Optionally, Synchronous Data Link Control/Direct Memory Access (SDLC/DMA) can be provided to 800K bit/sec; the transmission rates to 19.2K bit/sec are program selectable, according to the firm. Communications features include handshaking and modem control.

The system consists of a 256K-byte computer, floppy disk and Winchester hard disk with tape cartridge backup. The hard disk has 20M-byte capacity; the system has 16M bytes of addressable memory.

An eight-color 80-char. by 24-in. CRT terminal display is standard. The operating system, a Bell Laboratories, Inc. Unix-compatible enhancement, accommodates multiple-user and multiple-processing operations. Printer spooling and sharing, file protection and utilities are provided.

The system costs between $15,000 and $35,000, depending on configuration and volume, a spokesman said from 125 Ricefield Lane, Hauppauge, N.Y. 11787.

Avoid Communications Breakdown

Suffering from terminal boredom? Cramped by a communications breakdown? You can spell out relief by contributing to *Computerworld's* upcoming special report, entitled "Data Communications Terminals."

We are looking for expert user, vendor and editorial commentary on a wide range of data communications terminal topics including how to get the most out of dumb terminals, how terminals are making computers more responsive to users' needs and guidelines for evaluating terminsi equipment.

What trends do you foresee in terminals? How do you configure networks for multiple applications? What's happening with automatic teller machines? The answers to these and other germane questions should be expressed in application stories, tutorials and any other reasonable form that tickles your fancy. All we ask is that you put them in the form of five to seven, typewritten, double-spaced pages and send them to Bruce Hoard, c/o *Computerworld*, Box 880, Framingham, Mass. 01701.

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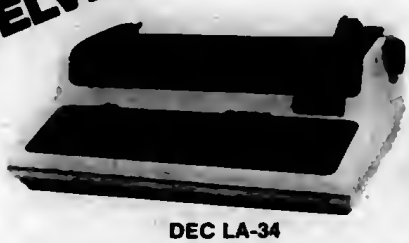

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NCP Offers Remote Printers

BLUE BELL, Pa. — National Computer Products, Inc. has announced a series of printers said to allow users to implement economical local and remote printing in departments, plants, offices and off-site locations.

The printers were designed for users of data communications systems made by IBM, Burroughs Corp., Sperry Univac, Honeywell, Inc. and NCR Corp. and print out management reports, documents, invoices, labels, tags and tickets in a variety of character styles at high speeds.

The printers are available in 160- or 340 char./sec matrix, 300 line/min matrix, 300- or 600 line/min solid character band and 40 char./sec daisywheel design.

With 60 days delivery, the printers are priced from $3,550 to $13,150 from the vendor, P.O. Box 154, Blue Bell, Pa. 19422.

IDS Unveils Modem, Communications Net Tools

LINCOLN, R.I. — International Data Sciences, Inc. (IDS) has unveiled a limited-distance modem, a bit error test set and a diagnostic data communications test set.

The Model 6210 limited-distance modem was designed for asynchronous operation over telephone company or private two- or four-wire nonloaded metallic (twisted pair) lines at speeds to 9,600 bit/sec.

It offers internal strap selections for constant or controlled RTS, high or low transmit level, two- or four-wire operation and normal or high receiver impedance. It costs $330.

The Model 1320 data test set was designed to analyze the error rate of any digital transmission network. It can be used to test synchronous, asynchronous or stop/start character-oriented systems such as time-division multiplexers. It costs $4,145.

The Hawk 4010 Datatrap was designed to monitor and interactively communicate with data appearing at the RS-232 interface. It locates and isolates problems in the hardware and software by simultaneously displaying both transmit and receive data.

It costs $5,775, IDS said from 7 Wellington Road, Lincoln, R.I. 02865.

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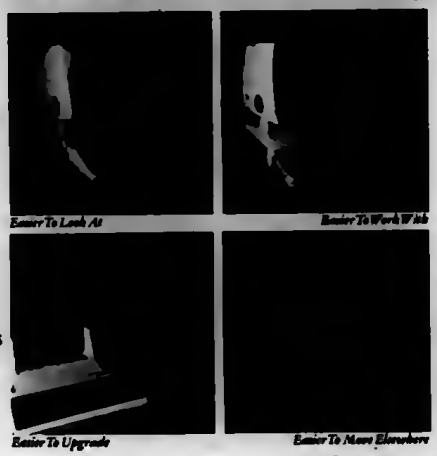

It's a word that best summarizes the benefits of the Memorex 2078 Display Station. Important benefits for users of some of today's most popular CPUs, including the IBM 43XX. And of today's most advanced communications protocols, like SNA/SDLC.

The 2078 Is Easier To Work With. People who are more comfortable are more productive. That's why there are more "people" features designed into the 2078. A non-glare screen and keytops. Non-reflective moldings. Recessed display. And a monitor that tilts 30% up and 15% down. There are also more operational features. Like a line and column indicator. An alternate cursor. An operator information line. And keyboard click and non-click select.

The 2078 Is Easier To Move Around. Space is always at a premium, be it on a desktop or an entire office work area. Which is why Memorex made the 2078 both compact and versatile. The whole package measures just 17" wide by 19" high by 24" deep. And it weighs a mere 55 pounds. A detachable keyboard, and a removable monitor that can be conveniently placed on a shelf, further increase workspace efficiency.

The 2078 Is Easier To Get The Way You Want It. It can be ordered with your choice of five screen capacities, from 960 to 3564 characters. With five keyboards, including 75-key EBCDIC typewriter, ASCII typewriter and EBCDIC data entry as well as 87-key ASCII typewriter and EBCDIC typewriter with numeric pad. And an impressive list of options, including selector light pen, security keylock, an unprotected field indicator and a special conditions alarm.

The 2078 Is Easier To Get When You Want It. It's built for SNA/SDLC, right now. It's built for customer installation in a matter of minutes. But for all of the reasons the 2078 from Memorex is easier to appreciate, the biggest might be delivery. Because 2078s are available in quantity, immediately.

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BSC Option Aids CA Net

IRVINE, Calif. — A dual Binary Synchronous Communications (BSC) option providing concurrent batch and interactive communications capabilities between Syfa network processing systems and mainframes is available from the Commercial Systems Division of Computer Automation, Inc.

The option was designed for Syfa users such as manufacturers who typically transmit business data in batches, yet desire interactive capabilities when seeking inventory, accounting, sales, personnel or other time-sensitive information stored in the host mainframe, according to the company.

The BSC controller, supported by a Syfa with a Model II processor, permits users to perform either remote job entry 3780 or Hasp batch data transmission simultaneously with 3270 terminal emulator interactive data entry/inquiry on the same system.

Syfa Dual BSC is supported by a Syfa network processor with a minimum of 128K bytes of main memory.

The controller option costs $4,000 and the Syfa network processing system alone costs from $29,000 to $100,000 depending on configuration, the firm said from 2181 Dupont Drive, Irvine, Calif. 92713.

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LARKS ELECTRONICS & DATA

Timeplex Offers Remote Diagnostics Service

By Brad Schultz
CW New York Bureau

NEW YORK — Users of Timeplex, Inc.'s Series II Microplexer series can get a remote diagnostics service at no charge from the Rochelle Park, N.J. vendor.

The service was recently demonstrated in a New York hotel room, from which Timeplex personnel dialed into the University of Illinois' Library Computer System in Chicago. For the demonstration, the university brought down two data channels emanating from an IBM 370/168 with 300 terminals, 100 printers, more than 100 modems and 60 Series II Microplexers.

The Series II Microplexer is an integrated statistical multiplexer/data concentrator. Between Aug. 15 and Nov. 15, users that file orders for the Timeplex product may gain the remote diagnostics service plus a 50% reduction in maintenance charges for the Series II, according to a spokesman.

Thus, the $40 monthly tab for maintenance on 8-channel Series II Microplexers would drop to $20; the $80 monthly charge for 24-channel maintenance would fall to $40.

Before a press gathering, Timeplex's technical operations manager used the remote diagnostics service to quickly isolate and identify problems with data communications equipment at the University of Illinois installation.

The service requires the Series II Microplexer's supervisory port option, a Bell 103-type modem and conventional telephone lines.

Basically, the remote service can address hardware and firmware problems among modems, multiplexers, concentrators and aimilar line gear, but not communications or front-end processors, a Timeplex spokesman noted.

For smart units with functioning microprocessors, the service covers circuit glitches and microprogramming bugs down to the level of individual components, he said. For units that lack functioning microprocessors, the service can trace problems down to the level of individual circuit boards, which could then be promptly unplugged and replaced.

Normal Security

The diagnostics service samples bit streams to do this sort of detective work, but Timeplex personnel cannot wield the service to tap "sensitive" data (violating normal security) without the user deliberately allowing it, the spokesman maintained.

The service was said to monitor loss of data, "marginal, intermittent or hard failure" in Microplexers, message transactions, line quality and channel status.

A typical scenario for utilization of the service would involve a user data center employee contacting a Timeplex field service engineer to report evidence of problems with data communications equipment. The engineer would then dial up the affected facility and study the CRT screen or teleprinter output while running tests that initiate with a few taps of the keyboard.

Most remote diagnostics will be rendered from Timeplex's field service headquarters in Hackensack, N.J., the spokesman stated. More information is available from Timeplex, One Communications Plaza, Rochelle Park, N.J. 07662.

SRT Modems Slated For U.S. Market

TEMPE, Ariz. — ITT Courier Terminal Systems, Inc. will begin marketing SRT Data Modem products manufactured by Standard Radio & Telefon AB of Sweden.

The company will offer four different modem configurations, including the 2084C for 2,400 bit/sec to 1,200 bit/sec, 2068C for 4,800 bit/sec, 2089 for 9,600 bit/sec and the DCB 19200 for a range of 192 to 9,600 bit/sec, the company said.

The modems will be priced from $860 to $7,200 from ITT Terminal Systems, Inc., 1515 W. 14 St., Tempe, Ariz. 85281.

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Collec interfaces to a bank's direct-deposit account system or any company's general ledger. It is also compatible with the vendor's Elcie letter of credit system and FTS '81 funds transfer and telecommunications system.

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Satellite Link Fits Hyper Nets

Model S720

MINNEAPOLIS — Network Systems Corp. has added a high-speed satellite link to its Hyperchannel product line.

The Model S720 Satellite Link Subsystem utilizes satellite services to interconnect local Hyperchannel networks.

The product accommodates link propagation delays and transmits full-duplex data at up to 44.7M bit/sec. The system consists of an A721 Hyperchannel Transmit Adapter and an A722 Hyperchannel Receive Adapter at each location.

Transmission errors are detected on the satellite circuit and reported to the receiver or initiator of the communication for appropriate resolution.

The S720 will be available in the first quarter of next year end costs $85,000, NSC said from 7600 Boone Ave. N., Minneapolis, Minn. 55428.

Burroughs-Compatible OP1/830 Emulates TD-830, MT-980 CRTs

HOUSTON — A CRT terminal that emulates Burroughs Corp. TD-830 and MT-980 terminals is available from Eastham & Associates. The OP1/830 terminals are plug compatible with the Burroughs terminals and support all Burroughs screen editing and highlight features.

The terminals are available in several models supporting Burroughs TDI, asynchronous and synchronous communications interfaces. Data rates up to 19.2K bit/sec asynchronous and 50K bit/sec synchronous are supported.

The integrated printer controller supports connection of high-speed printers addressed by the host as a separate remote device. Various remote configurations are available from the vendor with print speeds to 900 line/min supported.

The OP1/830 terminals start at $2,750, Eastham & Associates said from Suite 412, 11246 S. Post Oak Road, Houston, Texas 77035.

High-Resolution Touch Screen Allows Measured 'Finger-Touch' Data Base Access

BOHEMIA, N.Y. — A high-resolution touch screen that provides access to a data base by touching the screen with a finger is available from TSD Display Products, Inc.

Touch Screen is offered in 12- and 15-in. models. It consists of a thin transparent curved panel that mounts on the front of most standard CRT terminals and an electronic board that is connected to the panel with a cable. When the panel is touched, the location of the touch is measured and sent to a host computer as an RS-232 message.

Application areas for the Touch Screen include executive data base interaction, education, insurance, medical diagnosis and voter registration.

It costs $775 for the 12-in. model and $825 for the 15-in. model, TSD said from 35 Orville Drive, Bohemia, N.Y. 11716.

Multiplexer Gains Transmission Option

GERMANTOWN, Md. — Digital Communications Corp. has added a three-kilometer (1.86-mile) transmission option to its LM9500 Lightwave Multiplexer.

The LM9500 multiplexes up to 16 data channels, each having an input speed of up to 19.2K bit/sec asynchronous or 64K bit/sec synchronous, over an optical fiber to a host computer or other device.

The basic unprotected LM9500 costs $3,300 for eight ports and $5,200 for 16 ports. The basic protected 16-port model is $6,500. The three kilometer option costs $200 for the unprotected configuration and $400 for the protected configuration, DCC said from 11717 Exploration Lane, Germantown, Md. 20767.

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Level 66/DPS Processor Versatility Cited

Honeywell Helps Pittsburgh Solve Woes

Special to CW

PITTSBURGH — If Honeywell, Inc. offered a program to wash windows, city administrators here would probably be using it. The city is using a Honeywell Level 66/DPS processor to do just about everything else from tracking down illegal parkers to treating the city sewage system.

John McAllister, manager of City Information Systems (CIS) for the city of Pittsburgh, and five other city managers, each representing a major internal users group, make up the mayor's data processing advisory committee. McAllister, who chairs the committee, said, "There's obviously more to do than we have capacity for, so to establish priorities, we meet quarterly to reach a consensus on what we can accomplish with the available data processing resources."

The Honeywell Level 66/DPS Model 440, with 2M bytes of main memory, controls a front-end network processor, 2G bytes of disk file storage, four 9-track tape drives and two high-speed line printers. In addition, a Honeywell Level 6 processor, installed in December 1980 and now used primarily as a data entry facility, will be adapted to include more word processing (WP) applications.

Installed in May 1980, the processor is operated by Pittsburgh's 45-member CIS department within the mayor's office, which acts as a central DP agency for current city departments.

"We bought enough capacity to help us expand our services capability for the next five years," McAllister said.

The processor, operating under the Gcos operating system, doubled the capacity of the formerly installed NCR Corp. Century 300 system. Response time quickened from eight seconds to one and one-half seconds and communications speed into and out of the system increased from 1,200 bit/sec to 9,600 bit/sec, McAllister said.

However, increased capacity and faster throughput meant satisfying more of the mounting demands for services from the various departments. CIS now serves more than 20 departments, although the treasurer's office uses about 40% of the system to compile information in such areas as real estate taxation, utility billing and personal property taxes, he added.

Customer Base Access

For example, Dr. Stanley States, a water treatment chemist for the city, can now access Honeywell's extensive local city governments' customer base across the country.

"I can create specialized programs of my own," said States, who plans to eventually access Environmental Protection Agency (EPA) programs directly.

Also, by accessing the local library of time-sharing programs, city employees can share not only other cities' computer programs on Honeywell equipment, but also those on other vendors' processors, McAllister said.

"Converting from an NCR system to Honeywell went right on schedule with more than 800 programs converted," McAllister said. The project involved 10 full-time people — six from the CIS department and four from Honeywell. Conversion costs were listed and paid for in the contract.

"The key to this conversion was our mandate from the mayor's office that no new system development was to be undertaken until the conversion was complete," McAllister said. The NCR data base was converted to Honeywell's IDS-II and NCR Transaction Processing (TP) to DMIV TP.

To help reduce the host computer's work load and speed up application processing, the city of Pittsburgh decided to install a Honeywell Level 6 toward the end of the conversion process. The small computer is used as a data entry facility, capturing formats from a terminal's screen and filing that information on disk storage for later mainframe processing. Six internal departments are now also beginning to use the small computer for word processing applications.

"When an employee gasses up a city car, an embossed card activates the pump and its tiny microprocessor. Information from the card is then relayed to our Honeywell host computer which, by also showing gas used, provides the profile of fuel consumption of individuals and de-

(Continued on Page 54)

Dot Matrix Printer Can Image Labels

DAYTON, Ohio — Standard Register Co. has announced the Flexible Image Printer that prints in variable sizes, can produce bar codes, graphics and OCR A font characters.

The unit is an intelligent dot matrix line printer that is capable of imaging labels and other specialized documents as well as normal reports. Characters can be printed in a normal fashion, upside down or sideways. It can read from top-to-bottom or bottom-to-top modes and can print in reverse, the vendor said.

The unit can print at 300 line/min and costs between $9,550 and $12,700 and leases for between $320/mo and $450/mo, the vendor said from P.O. Box 1167, Dayton, Ohio 45401.

Translator Boosts Plotting Speed

SANTA CLARA, Calif. — Versatec, Inc. has announced a raster data translator said to enable users of its Versatec 200 point/in. printer-plotter to draw with 100 point/in. resolution data for faster plotting speed.

The translator can double plot size and smooth duplicated data while allowing users to select smoothing, a hardware algorithm circuit that smoothes duplicated data by adding points to jagged lines.

The translator has three buffers that store up to 1K plot bytes of data and print data is passed through transparently, the company claimed.

With deliveries set for October, the Raster Data Translator is priced at $1,900 from Versatec, 2805 Bowers Ave., Santa Clara, Calif. 95051.

System Offers Time-Shared Graphics

TROY, Mich. — An interactive, computer-generated color slide creation and delivery service has been announced by Color Terminals International, Inc.

A user buys a company color graphics terminal that allows access to a national time-sharing network and to software created exclusively for the Artis system, the company said.

With a modem a user dials into the network and color slide images are created interactively at the terminal while on-line to the network data center, enabling a low-resolution color hard copy to be made at the user's site from the Artis-created images, the vendor claimed.

Images are then transmitted digitally to Color Terminals' slide production center, with output shipped back to the user within 48 hours, the company said.

Artis color graphics system, including graphics terminal and console, hard-copy printer and maintenance, is priced between $15,000 and $20,000, with time-sharing services transaction-priced from Color Terminals International, Inc., 799 Stephenson Highway, Troy, Mich. 48084.

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Honeywell Helps Solve Pittsburgh's Woes

(Continued from Page 53)

partmental vehicles. By recording each vehicle's mileage, the main computer helps us prolong the lifespan of our fleet by maintaining a regular vehicle maintenance program," McAllister said.

Traffic court is another beneficiary of the city's Level 66/DPS large computer. All moving and parking violations are kept by license plate number in the computer's data base.

Tapes of this information are sent to the state of Pennsylvania and once the state supplies the corresponding names and addresses, Pittsburgh's traffic court mails out the summons.

Public Served

"The system brings in about $2 million per year from traffic violations and, as a result of the increased processing speed and accuracy, the general public is better served," said Allan Penkower, Pittsburgh's chief magistrate.

From terminals at the police station, officers can view an individual's traffic record, if a person has collected a certain number of unpaid traffic and parking tickets, his car's description is given to the "scofflaw" squads of meter patrollers and when spotted, the car will be towed. Out-of-state license plates are also cataloged historically.

McAllister said that new standards of efficiency and security were created. For instance, a file management system was established for the first time for the tape library.

Instead of passwords being written in by the user, as was done with the previous system, the new computer has this security built into its software, helping to ensure that only authorized users have access to private information.

"We've seen increases in productivity not only through computer system improvement such as more time-sharing capabilities, but also because our employees in data processing and internal user departments know what's available to them and use the system correctly," McAllister concluded.

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SMS Ships Controllers

MOUNTAIN VIEW, Calif. — Scientific Micro Sytems, inc. has announced it is shipping its FWD0101/FWD1101 Winchester/floppy disk controller for Digital Equipment Corp. PDP-11 processors.

Features include an on-board bootstrap capability, DEC RX02, IBM 3740 single-density capability and IBM 2/2D double-density diskette formats.

Automatic recognition of DEC and IBM formats allows program and data interchange without shutting down the computer system, the vendor said.

Disk Support

The unit features between 8.9M to 35.6M bytes of storage and the unit supports Shugart or Quantum disk drives, the vendor said.

With DEC memory buffering, the unit can achieve a 40-sec per 1M-byte backup and restore operation and large-block DMA transfers are 543K bytes/sec. Using IBM double-density formats, a single diskette stores up to 62.5K byte/sec, the vendor said.

The controllers are priced from $1,550, the vendor said from 777 E. Middlefield Road, Mountain View, Calif. 94043.

DEC* Analyzed!

★ ★ ★ ★ ★ ★

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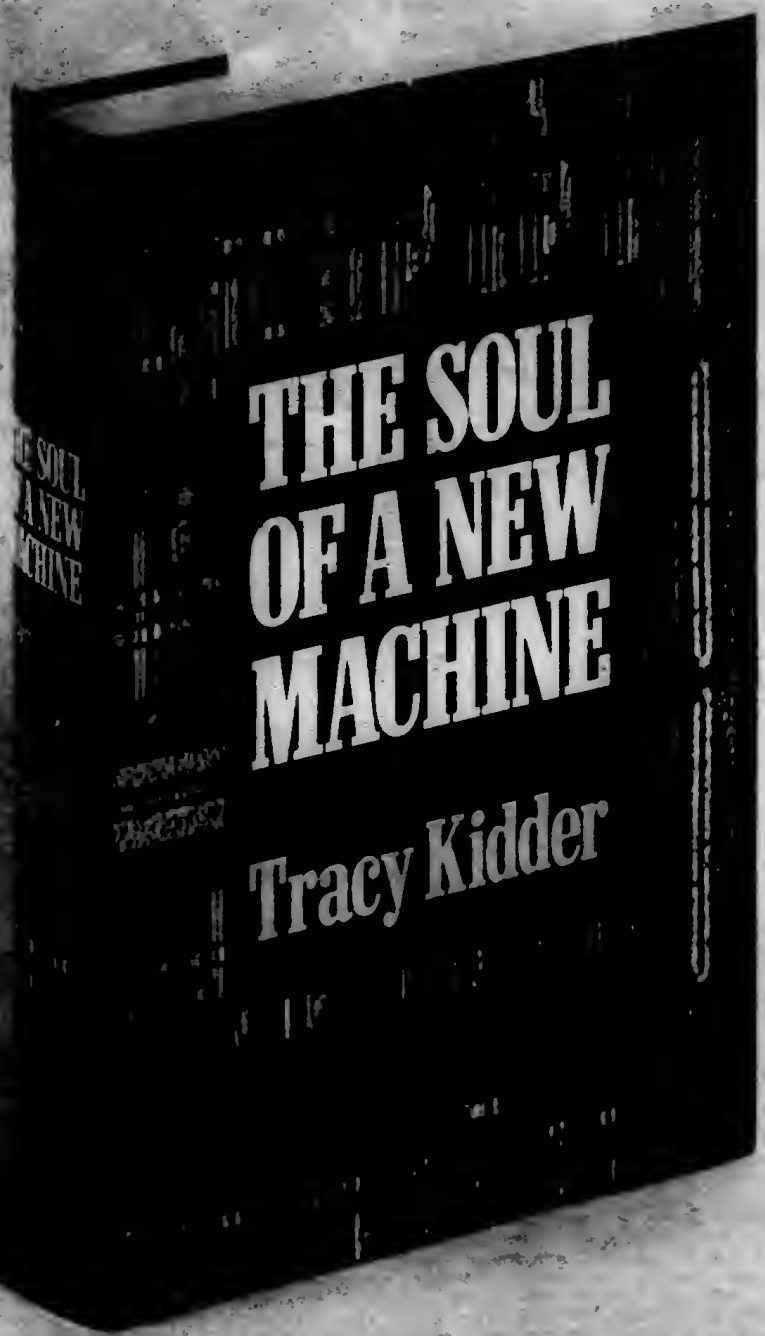
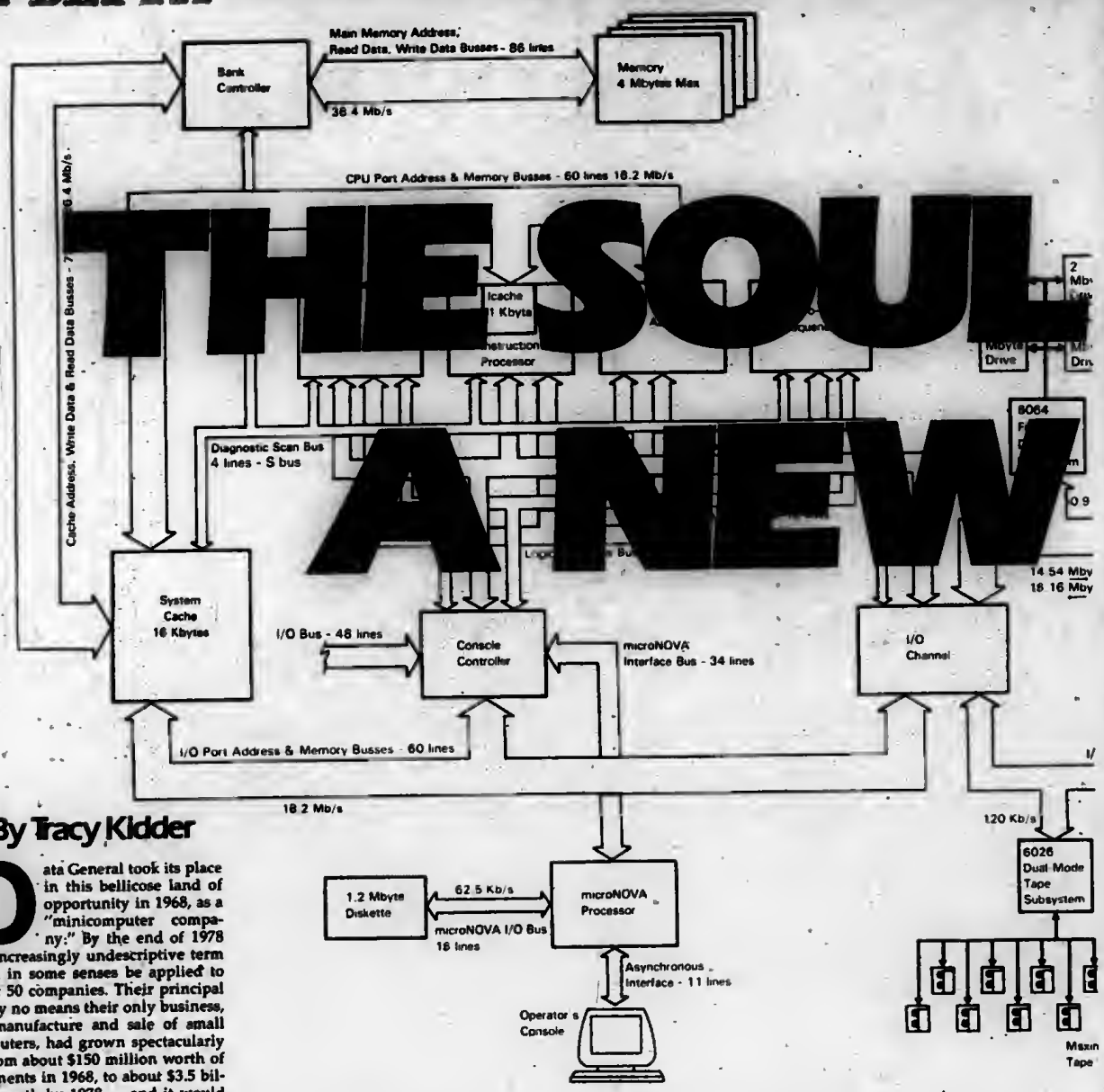


First of a Two-Part Series
Featuring Interview With Tracy Kidder

THE SOUL OF A NEW



By Tracy Kidder

Data General took its place in this bellicose land of opportunity in 1968, as a "minicomputer company." By the end of 1978 this increasingly undescriptive term could in some senses be applied to about 50 companies. Their principal but by no means their only business, the manufacture and sale of small computers, had grown spectacularly — from about $150 million worth of shipments in 1968, to about $3.5 billion worth by 1978 — and it would continue to grow, most interested parties believed, at the rate of about 30% a year.

By 1978 Data General ranked third in sales of minicomputers and stood among the powers in this segment of the industry. The leader was Digital Equipment Corp., or DEC, as it is usually called. DEC produced some of the first minicomputers, back in the early '60s. Data General was the son, emphatically the son, of DEC.

A chapter of DEC's official history, a technical work that the company published, describes the making of a computer called the PDP-8. DEC sent this machine to market in 1965. It was a hit. It made DEC's first fortune. The PDP-8, says the official history, "established the concept of minicomputers, leading the way to a multi-billion dollar industry." But the book doesn't say that Edson de Castro, then an engineer in his 20s, led the team that designed the PDP-8. The technical history mentions de Castro only once, briefly, and in another context. They expunged de Castro.

In 1968 de Castro and two other young engineers seceded from DEC. Several completely different versions of their flight exist and have by now acquired the impenetrable quality of myth. Did they quit because, after long and heartfelt labor on a new design, they found that DEC's management would not build their new machine? DEC's management did turn down a new design of de Castro's and afterward, along with a man from another company named Herb Richman, de Castro and the two other engineers from Digital incorporated Data General and started building their own minicomputer.

But did they design this new machine after they seceded, or had they done that job in secret, using DEC's facilities, while still on DEC's payroll? One version of the story suggested the latter. More than 10 years later, DEC's founder and president would tell reporters from *Fortune*, "What they did was so bad we're still upset about it." But DEC never sued Data General's founders, and clearly there were other reasons why Digital might have become upset. For within a year, de Castro and company had set up shop in DEC's own territory and had started raking in the loot.

Interview With Tracy Kidder On In Depth/6

They rented space in what had been a beauty parlor, in the former mill town of Hudson, Mass. Practically all that remains of that time is a black-and-white photograph of this first headquarters. In the foreground stand four young men with short hair, wearing white shirts and skinny ties and the sort of plain black shoes that J. Edgar Hoover's men favored. They are engaged in what is obviously meant to look like routine conversation. The linoleum floor, the metal furniture, evoke motor vehicle departments, and the youths in the picture could be members of some junior chamber of commerce, playing capitalists for a day.

Not shown in this bemusing picture is the shrewd and somewhat older lawyer from a large New York firm who helped Data General's founders raise their capital and who became a crucial member of their team. What also doesn't show is the fact that some of these young men were already computer engineers of no mean repute — their age in this case was no impediment, for computer engineers, like athletes, often blossom early.

They also entered a good territory for fledglings. They could not have dreamed of moving in on IBM's markets without truly vast amounts of

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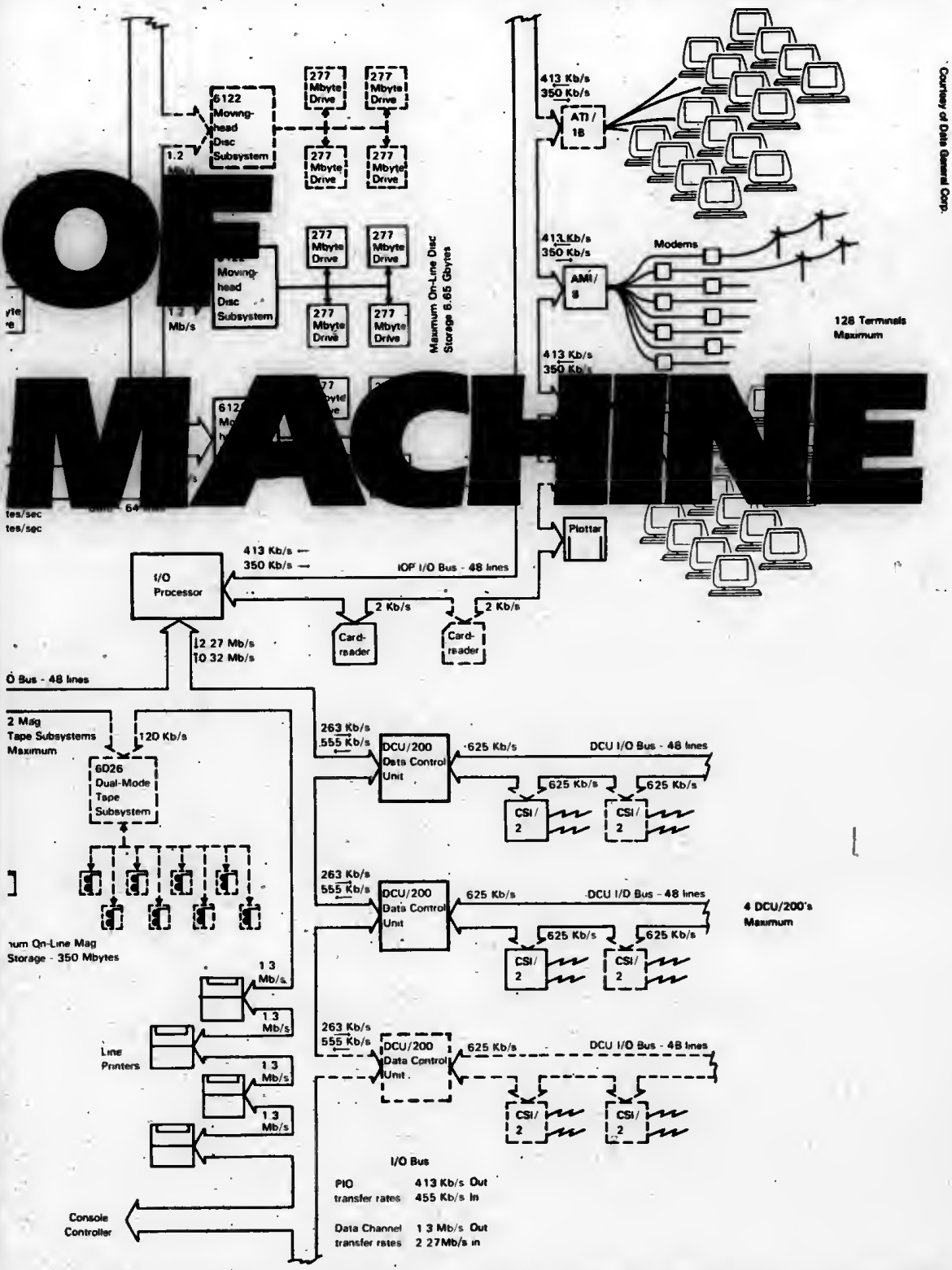
OF MACHINE



Courtesy of Data General Corp.

capital. But the people who bought minicomputers — engineers, scientists and, mainly, purchasing agents of OEMs — understood the machines. A new manufacturer could reach them through relatively inexpensive ads in the trade journals and didn't need to build a service organization right away, since these customers could take care of themselves. These were also the sorts of customers who could be expected to embrace a newcomer, if the price was right; they'd prefer a bargain to a brand name.

But around the time when Data General established itself in the beauty parlor, other entrepreneurs were starting up minicomputer companies at the rate of about one every three days. Only a few of those other new outfits survived the decade, whereas Data General, before it had exhausted its first and fairly modest dose of capital, achieved and never fell from that state of grace, a positive cash flow. Why?

The company's first machine, the Nova, had a simple elegance about it that computer engineers I've talked to consider admirable, for its time. It had features that DEC's comparable offering didn't share and it incorporated the latest, though not fully proven, advances in chips. Data Gen-

(Continued on In Depth/10)

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Announcing the HP 3000 Series 44.

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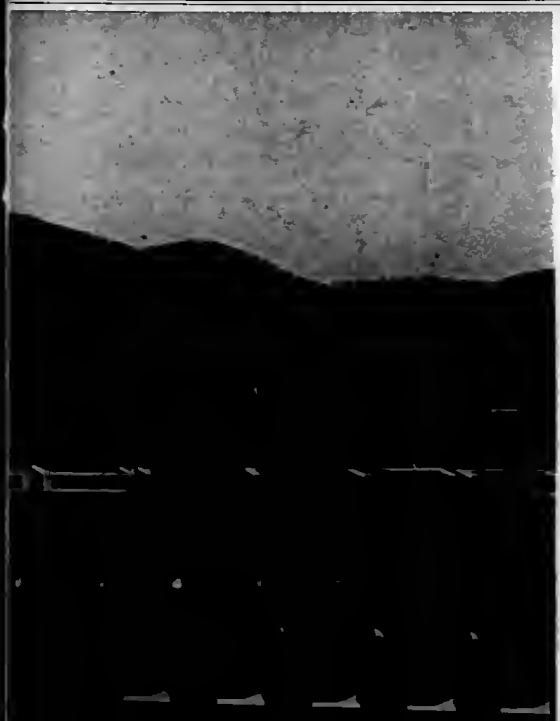

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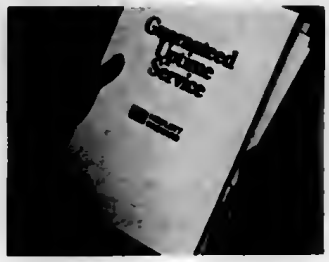

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IN DEPTH INTERVIEW:

How long did you work on this project?

About two and one-half years. I started when the project was really getting into high gear. I didn't go inside until they started debugging; I had to reconstruct what had happened prior to that. I was physically inside and going in and out through the normal security procedures. Everybody there knew I was writing a book; I made that very clear to everyone.

How did you first learn of the Eagle?

My editor at *The Atlantic*, Richard Todd, suggested I look into computers. Dick knew Tom West at Data General and I went to talk to him. In our conversation I learned he and I both liked to sail. I needed some help sailing a boat from Maine to New York, so I invited him along. I got to know him better on that trip and ended up writing about it in the Prologue.

I became quite interested in him after that. I was at his house some time after that and suggested one idea to write about. "Well, that really doesn't interest me," he said. So I said, "What does interest you?" He replied, "What we're working on now," which was the Eagle.

Were there problems with corporate secrets or confidentiality?

West said I had permission to go in. There were issues of trade secrets and I had to agree not to describe the project until it was made public. That seemed reasonable.

Later on, I also agreed to show pieces of the book to some of the people who were named in it — to engineers, but not to corporate management. I did not in any way give the company control over what I wrote. I felt strongly about that.

I drew a sharp distinction between the engineers and the corporation. I was asking for access to the engineers' lives, since they weren't accustomed to dealing with journalists. I didn't agree to change anything at their command, but I didn't want to ruin anyone's career, after all, and it turned out all right. They were very open and honest, as a rule, and they weren't afraid of things that they thought were true. They were mostly afraid that something would be inaccurate.

How many people worked on the Eagle?

In the hardware team itself, about 30, but some people quit and others were brought in, of course. There was an enormous software effort, too — about the same number of people busting their chops. In the end, there were just hoards of people involved. At one point I thought I would include the software effort too, but then I realized I had to limit myself or it would get out of hand.

One of the problems was even with 20 characters it was too much — I couldn't even write about all of the hardware team.

Did you get to know many of the people?

Yes, some better than others, of course. They were really nice, and patient, too. Several of them are still good friends. And perhaps for some of them I was someone from the outside to talk to.

Did you ever have the feeling that your presence, with the possibility of a book, was a catalyst in getting the Eagle successfully completed?

No, no, I was not. Although, at some point, I realized that one of West's main motives for having me around was to create more excitement. One kid said to me, "Well, what we're doing must be important, because you're writing about it," which West thought was just hilarious.

He used every opportunity to make it as exciting as he possibly could. And I think he thought the book would be a reward for these guys. There's always a tendency after a project for history to get revised and have things retold and I think West was anxious that there at least be a record. West made me a member of his team in the sense that he always made me feel Eagle was going to be a success. Some time long afterward he said, "You don't know how close we came [to failing]."

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TRACY KIDDER

By Jack B. Rochester

Tell me a little about yourself.

Well, I went to Harvard as a political science major, but changed to English.

Why?

I took a course from Henry Kissenger and it bored my socks off, so I quit. in a sense, though, I regret changing to English. I had never taken physics or math. Later I said to myself, look, there are ways of understanding these things, they are important and I am going to do it. So f began writing articles on scientific topics snd in the process I learned a few things, I guess.

Yet English must have helped you become a professional writer.

My advice is, if you want to be a journalist, the best thing to do would be to avoid English or journalism school. I think the best thing is to know and understand something about the world.

My theory ol journalism is that you really owe it to your reader to try to bring elements into it that make Ior *good stories*. After all, this is a reflection ol the world sround us; you want characters, you want plot, you want to find out what makes people do what they do. The best nonfiction always blends the hard factual material neatly into a curiosity about the poeple involved. With *The Soul of a New Machine* I tried to take all of the historical materials, something about the industry and the technical information and weave it into the narrative.

You mentioned your interest in science. What are your views on computer technology?

Well, computer engineers have lived in great obscurity for some time. They think what they do is pretty interesting and I think it's nice that what they do is being recognized. Their work is certainly fraught with personal and social dangers and f can't help but think that people must begin to find out what computers are all about. After all, their prime function is not to play "Adventure."

Computers may not be as obviously significant as some people make them out to be — I think I refer to that in the book as "chronocentrism," the idea that the machines of your time are the scariest — because if you look back at the stuff that was written about the railroads when they first came in, you get pretty much the same feeling. Of course computers are significant, but they are machines of the second order — more insidious, transparent.

The distinction between building general-purpose computers and the ways in which they're used is quite different. I found that many computer engineers really care about their uses, but are pretty much excluded from that part of it. The pundits say they hope computer engineers will exercise virtue and restraint, but there's no opportunity!

You speak enthusiastically about computers.

Yes. To understand the computer doesn't mean having to know how to write software. The computer is not mysterious; it's just another sort ol engine that can do some pretty impressive things.

I guess what f was after in writing *The Soul of a New Machine* was an exciting story. I wanted the reader to see and identify with these people who are almost thought to be alien creatures. It's a strange and interesting profession and one that's producing enormous amounts of wealth, so it's intrinsically interesting to me on that basis.

Do you feel our society is coping well with technology?

Not always. Take calculators, Ior instance. If children don't learn mathematics, how to manipulate numbers, sooner or later there will be no one to build computers. You have to understand mathematics to write the floating-point instructions in microcode. You can't rely on a hand-held calculator.

Perhaps we're coming to the day when, as a friend ol mine said, you put a computer in Iront of a pile of sand and you get a better computer out the other end. f'm not particularly looking forward to that day. I leel this is one ol the last cralts.

Do you have a home computer?

No . . .

Are you interested in a word processor?

I don't know. It's certainly one of the most interesting things I've ever seen, but, after 15 years, f'm comfortable typing. I need to write and rewrite, typing draft after draft.

Near the end of the book, you say to Tom, "[The Eagle] is really a small thing in the world, you know."

And he replies, "I know it." It is, but from a journalistic perspective, I think you can learn more about the state ol things in general by closely examining one little corner. Every little corner of the world excludes something, to its own sorrow, perhaps. Engineering does that to some degree; it has its own blind spots. I hope the reader will understand engineering better by reading about engineers in the book.

Do you believe computers have the ability to improve the quality of life?

We have to live in the modern world, you know. We have a modern economy and many aspects of it are marvelous. I don't like to see computers used to make life less interesting; for example, some of these ideas for the automated office are heinous and stupid.

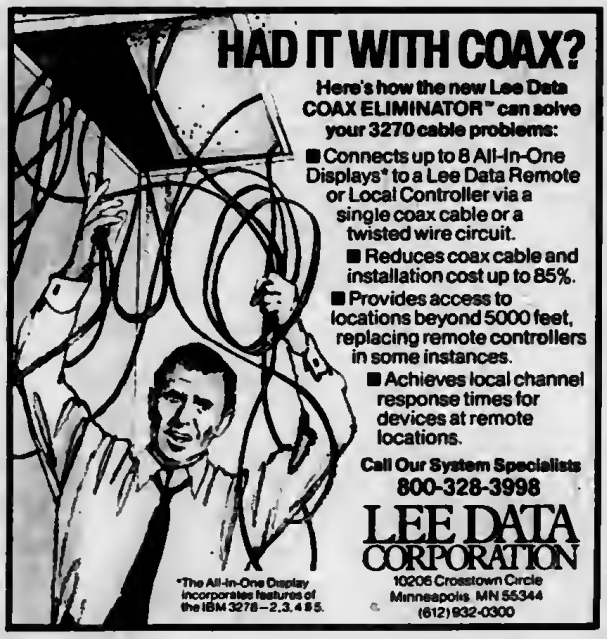
CW Photo by J. Rochester

Author Tracy Kidder and His Book

Chuck Holland and I were talking over a couple of beers at his house once about his vision ol how the world might be. He said the time will come when your home will be practically a simulator. But then, he said, if the computer takes something away from us, we'll take it back. He added that he thought a lot ol people would get screwed in the meantime.

I hope that these things will sort themselves out.

"The Soul of a New Machine" continues on In Depth/10.



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IN DEPTH

(Continued from In Depth/3)

eral could build the Nova very cheaply.

Such an important advantage can depend, in computers, on small things. In the case of the Nova, the especially large size of the printed circuit boards — the plates on which the chips are laid down — made a crucial difference. For several reasons, large boards tend to reduce the amount of hardware in a computer. Data General used boards much larger than the ones that DEC was using. Speaking of this difference and of other less important ones, one engineer remarked, "The Nove was a triumph of packaging."

In the computer business, your market can be your fate. Although by the late 1970s it was hard to define e company's place in the industry by the sorts of machines that it made, certain broad historic distinctions in ways of doing business still divided the industry into three segments.

The differences showed up in the nature of e company's expenditures. IBM and other mainframe companies spent more money selling their products and serving their customers than they did in actually building their machines. They sold their computers to people who were actually going to use them and this market required good manners.

Microcomputar companies soid equipment as if it were corn, in large quantities; they spent most of the money making things and competed not by being polita, but by being aggressive.

Minicomputer companies split the differences; they sold some machines and service to actual users, but spent most of their money on hardware and did e big business by selling machines in quantity to OEMs.

At the end of fiscal 1978, after just 10 years of existence, Data General's name eppeared on the list of the nation's 500 largest industrial corporations — in that band of giants known as the Fortune 500. It stood in 500th place in total revenues, but much higher in respect to the various indices of profit and, for e while, climbed steadily higher on the list.

Surely by 1980 such e record entitled Data General to respectability. But some trade journalists still iooked askance at the company; one toid me Data General was widely known among his colleagues as "the Darth Vader of the computer industry." Investors still seemed jittery about Data General's stock. An article published in *Fortune* in 1979 had labeled Data General "the upstarts," while calling DEC "the gentlemen." The memory of that article still rankled Herb Richman.

In every segment of the industry, companies announced small new products for sale every day. Companies brought out new lines of computars, much more powerful than the ones they replaced, only every few years or so; but considering all the work that went into them and the fact that they required a redirection of effort throughout a company, the pace et which these major announcements came was very rapid.

Conventional wisdom held that if e company fell very far behind its competitors in producing the latest sorts of machines, it would have a hard time catching up. And failure to stay abreast could have serious consequences, because mejor new computers played crucial roles in the other business of the companies; they helped them seli all their little products end, often, their older types of machines.

At some companies the task of guarding egainst this sort of crisis fell mainly to engineers, working below decks, as it were. Executives might make the final decisions ebout what would be produced, but engineers would provide most of the ideas for new products. After all, engineers were the people who really knew the state of the art and who were therefore best equipped to prophesy changes in it.

At Data General, an engineer could play such an important role. It was there for the taking. The president, de Castro, liked "self-starters," it was said. Initiative was welcomed et Data General and in the late '70s it eppeared fhat the company had need of some initiative from its engineers. For Data General was in e bind. The firm had fallen behind the competition: it hadn't yet produced the latest big thing in minicomputers.

Into the world of the minicomputer e new thing had been born, e class of computer known as e 32-bit supermini. Tom West said, with characteristic enthusiasm: "Everyone thinks they want one now. It's an emotional issue. In fact, it's kind of e fire storm." As for the present state of affairs, sometimes he called it "a disaster." Sometimes he would say, "We're gonna get schmeared if we don't react to VAX."

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IN DEPTH

A number of Data General's rivals had produced 32-bit superminis and the most important from West's point of view was the computer that DEC had recently sent to market, a machine called the VAX-11/780. Data General, meanwhile, had not yet produced a computer of this class. Many people, including West, believed that they must do so, and in fairly short order.

Partly it was a matter of keeping up appearances: Customers get married to their computer companies in many different ways and they don't usually want to get or stay married to a company that has fallen behind the state of the art. Besides, you had to grab a piece of the new market for the 32-bit supermini because that market was huge and growing fast; most observers agreed that it would be worth several billion dollars by the middle 1980s.

You did not have to be the first company to produce the new kind of machine; sometimes, in fact, it was better not to be the first. But you had to produce yours before the new market really opened up and customers had made other marriages. For once they are lost, both old and prospective customers are often gone for good.

It had been painful for West and for a number of engineers working with him at Westborough to watch DEC's VAX go to market, to hear it described as "a breakthrough," and not have a brand-new machine of their own to show off. It had been painful for them to read in the trade press of the VAX's growing success; VAX was beginning to look like one of those best-sellers that come along only once in a while.

'To make the project work they'd have to hire the very best new engineers they could find, ones who would know more about the state of the art in computers than they did. Smiling, West allowed that if they did this, they might be hiring their own replacements — their own assassins. Even if they did hire prodigies, of course, the scheme might not work. Maybe you couldn't build a major CPU with kids. It was awfully risky. it was a compelling idea.'

But by the fall of 1978 West had drawn around him a team of enthusiastic engineers and they were finally working on their own supermini, which they had nicknamed Eagle. A new computer, especially one of this class, does not get built in a month. Often it takes years to bring one to life. But it wasn't too late, West was saying. Not if they could build this computer in the record time of something like a year.

This was at last "the right machine." This was "the answer to VAX." At times West fancied that this computer would become the source of Data General's continued ascent in the Fortune 500. "This is the second billion," he said. His doubts he did not share widely.

Why had Data General failed to produce a rival to VAX? When trade journalists asked this question, Data General put on a bold face, of course, and suggested in essence that all was proceeding according to plan. In fact, years before the appearance of VAX, Data General engineers had forseen the advent of such machines. For about five years they had been trying to produce one of their own. But there had been problems. They had made some false starts, and the engineers involved had been arguing over who was going to produce this new machine and what it would be.

West came to Data General in 1974, joining Carl Alsing and the other engineers who were attempting to bring the first Eclipse to life. To Alsing, West appeared to be just a good, competent circuit designer, but strikingly adept at finding and fixing the flaws in a computer. "A great debugger," Alsing considered him. "He was so fast in the lab I felt I was barely adequate to hold the probes of the oscilloscope for him."

Alsing took a shine to his new colleague almost at once. The morning after an Eclipse Group party, he and West, on the spur of the moment, took a trip to Provincetown on Cape Cod. Alsing was amazed at how easily West found his way among strangers and how he seemed to be able to identify the most interesting bars by just glancing through their doorways. West possessed that town for

(Continued on In Depth/14)

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October 5 (Day 1)

8:45–9:15 **Keynote**
A-1

9:15–9:45 **Coffee Break**

9:45–10:45 **Mini & Micro-Based**
A-2 **OEM Business Update**

I. Starting and Staying in Business
a. Business Structure
b. Financing
c. Successful Business Plan

II. Economic Forecast
a. Reagonomics
b. Boon or Bust

9:45-10:45 **The Magic of Sales**
a. Organizing the Operation
b. Qualifying & Hiring a Sales Force
c. Defining Sales Objectives
d. Prospecting Customers
e. Motivating a Sales Force
f. Closing a Sale

11:00–12:00 **OEM Survival Tools for**
A-4 **the 1980's**
The survival of an OEM depends upon the firm's ability to make a consecutive series of complex market decisions concerning what market segments to pursue, what product features to include and what sales strategies to employ. Many companies run into difficulties because these crucial decisions are opinion based rather than data based. This session introduces a number of simple, practical tools that every OEM can employ to more astutely analyze the marketplace and respond to its ever-changing demands.

11:00–12:00 **Acquisition and**
A-5 **Diversification**
Mergers and acquisitions, the viable alternative to corporate growth
a. The pros and cons of merger vs. going public
b. Why a company should consider merger and or acquisition as a sound way to grow
c. How to properly plan an orderly merger/acquisition program.
d. Why mergers/acquisitions help make a company more competitive in the marketplace.

12:00–1:30 **Luncheon**

1:30–2:30 **Influence of Growing Local**
V-1 **Networks (Part I)**
a. What's hot and why
b. Where are we headed & what's the time frame?

2:45–3:45 **Influence of Growing Local**
V-2 **Networks (Part II)**

2:45–3:45 **Intelligent VDTs and Desk-**
V-3 **top Systems**
a. Impact as net elements
b. Distributed data bases
c. Can we do without a mainframe?

1:30–2:30 **Input/Output: Market &**
T-1 **Technological Structures**
a. Printers.
b. CRTs.

2:45–3:45 **Mass Magnetic Memory:**
T-2 **Market & Technological Structures**
a. Overview & future trends
b. Floppy, Winchester & other disk memory
c. Streamers vs. start-stop tape drives.
d. 64K bit/chip and beyond.

4:00–5:00 **Voice I/O and Other**
T-3 **Analogue I/O: Market & Technological Structures**
a. When do benefits equal cost?
b. Architecture examples

1:30–2:30 **Retail Outlets**
O-1 a. What's the outlook?
b. Will the big boys dominate?

2:45–3:45 **Are You Ready for an**
O-2 **Ad Agency?**
a. Make or buy criterion?
b. Agency selection
c. How you and your agency can best work together.
d. Where can consumer-level tactics work?

4:00–5:00 **OEM Agreements**
O-3 a. Franchise fees.
b. Sales territories, distribution rights
c. Quotas, credit, payment
d. Second sourcing protection

1:30–2:30 **Application Generating**
V-1 **Tools**
a. Benefits of "user friendly systems
b. Increasing profits and productivity through the use of application generators
c. Developing and marketing a system with an application generator as the nucleus

2:45–3:45 **Software Management**
V-2 **Strategies**
a. Value added software development
b. Documentation. Gaining a multiplier for software support
c. Transportability. Controlling competitive influences
d. 24 ways to improve turnkey software

4:00–5:00 **Application Dynamics:**
V-3 **Planning for Changes**
a. Processor independent transportability
b. Compatibility for expansion
c. Holding down maintenance overhead.

1:30–2:30 **Microcomputer Trends**
P-1 a. 8, 16, 32 bit processors
b. Trade-offs & time frame
c. The effects of plummeting costs on high-level processors & high-capacity memory chips
d. The near-term system of the future – 32-bit micro & 256K bit RAM chips?

2:45–3:45 **Legal Aspects of the**
P-2 **Third Party Market**
a. Legal aspects of OEM vendor arrangements from both the manufacturer and OEM perspectives.
b. Manufacturer, distributor, dealer, rep., final customer, who can get burned the most and what degree of protection is possible.

4:00–5:00 **Desk-top Computer**
P-3 a. Struggle for the right niche in a viper's nest of competition.

1:30–2:30 **IBM Watch**
C-1

2:30–2:45 **Coffee Break**

2:45–3:45 **HP Watch**
C-2

4:00–5:00 **TI Watch**
C-3

October 6 (Day 2)

8:30–9:45 **Japanese Vendors**
B-1 **"Meet the Press"**
Four Japanese vendors will be interviewed by editors from leading computer newspapers, business publications and financial journals about the growth of Japanese firms in the U.S. domestic markets.

9:45–10:15 **Coffee Break**

10:15–11:15 **Software: The Growth Area**
B-2 **of the Decade**
a. Market strategies
b. Managing software projects. If you can't plan it, you can't do it.

10:15–11:15 **Financing Your Business**
B-3 **and Product Development**
a. How much money is needed to start and stay in business? Proformas?
b. Forecasting budgeting
c. Working capital venture capital.

11:30–12:30 **Sales & Marketing Planning**
B-4 a. Mktg goal & objectives
b. Common errors.
c. Key account strategies.
d. Distribution channel considerations
e. External & internal organizational structures

11:30–12:30 **The Service Alternative**
B-5 a. When does free consulting and service become a profit killer?
b. The OEM and the service questions. Is there a service requirement? Advantages and disadvantages to the OEM. Methods available to accomplish solve service requirements.

12:30–2:00 **Luncheon**

2:00–3:00 **Europe as a Market**
M-1 a. Are you ready?
b. Is Europe ready for you?
c. Effective channels of distribution
d. Marketing philosophies among countries

3:45–4:15 **Beyond the European**
M-5 **Market: The Next Step?**
a. Best bets
b. Update on the market
c. Channels of distribution.
d. Maintenance and service

2:00–3:00 **PR: The Unified**
U-4 **Corporate Philosophy**
a. Agency selection.
b. Developing the plan & positioning the product.
c. Press tours/conferences.
d. Releases.
e. Editor contact & the importance of personal involvement.

3:15–4:15 **Office Automation; One**
U-5 **Stepping Stone Beyond WP?**
a. Overview and future trends.
b. Strategies and techniques for OA equipment sales.

2:00–3:00 **Special ADAPSO Session**
P-4

2:00–3:00 **Sourcing Software**
S-4 a. An overview of the problem in today's market.
b. Make or buy? Realistic estimating of costs.
c. Evaluating packages for resale.
d. Evaluating a custom software house.

3:15–4:15 **Watering the Software**
S-5 **Desert**
a. Potentials of dealing with software publishing houses.
b. Alternatives in distributing software. Computer manufacturer programs to classified ads.

2:00–3:00 **DG Watch**
C-4

3:15–4:15 **DEC Watch**
C-5

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CW6

IN DEPTH

(Continued from In Depth/11)
an evening, as if he'd lived there all his life and was showing Alsing around.

One time Alsing stayed up all night in a lab programming a batch of ROMs, or "read-only memory" chips. West found Alsing still at this work the next morning and, laughing, he cried out: "Alsing! You're a ROM-driven man!" Then West made up a song by that title to the tune of "John Henry." West was always inventing catchy expressions and "ROM-driven" was Alsing's favorite.

The contents of a ROM, once programmed into the chip, cannot be altered or erased; the information can only be "read." *ROM-driven:* it opens up the ancient question of predestination and free will. Later, Alsing would wonder how the phrase applied to his friend. So would West, apparently, for one day downstairs, during the Eagle project, he would ask — laughing his nervous-sounding laugh, "Doesn't anything around here happen by accident?"

From West, Alsing was able to glean only a few biographical facts: that he had gone to Amherst College, majoring in physics there; that he had worked for the Smithsonian Institution afterward, building digital clocks, among other things, and traveling a lot; that he had quit that job after seven years, and had virtually taught himself computer engineering while working for RCA.

There was a little more: West's father was an important man, one of the most senior executives of AT&T; West had a wife and daughters; West played the guitar well and personally knew many famous folksingers. Alsing listened to his stories. West told him that one night, while he was traveling through Mozambique on business for the Smithsonian, he got out of a Land Rover and yelled into the darkness: "Massachusetts! Massachusetts!"

"I thought someone might hear me," West explained, "and someday there'd be a bunch of kids running around out there named Massachusetts."

Alsing clapped his hands and laughed and laughed. He always wanted to hear more.

West had been to places that Alsing never dreamed he himself would visit. Alsing could not help envying him a little, not least of all because West seemed so free. West was, to Alsing then, like that mysterious stranger just passing through town.

West told him about quitting his job with the Smithsonian on the spur of the moment, and of a troupe of latter-day gypsies — a band of youngsters on the roam who had camped in a field near his house. Alsing was left feeling that if those gypsies passed through town again, West might go away with them. When West talked about his music, Alsing got the same feeling; he fully expected to come to work some morning and find that West had departed for good, most likely without leaving a forwarding address, and the idea charmed Alsing — and also made him feel a litle sad, of course.

But it didn't turn out that way. When the first Eclipse went to market and the group's original leader began to take leave, in order to work on FHP, West asked that he be given command of the team. West seemed

(Continued on In Depth/16)

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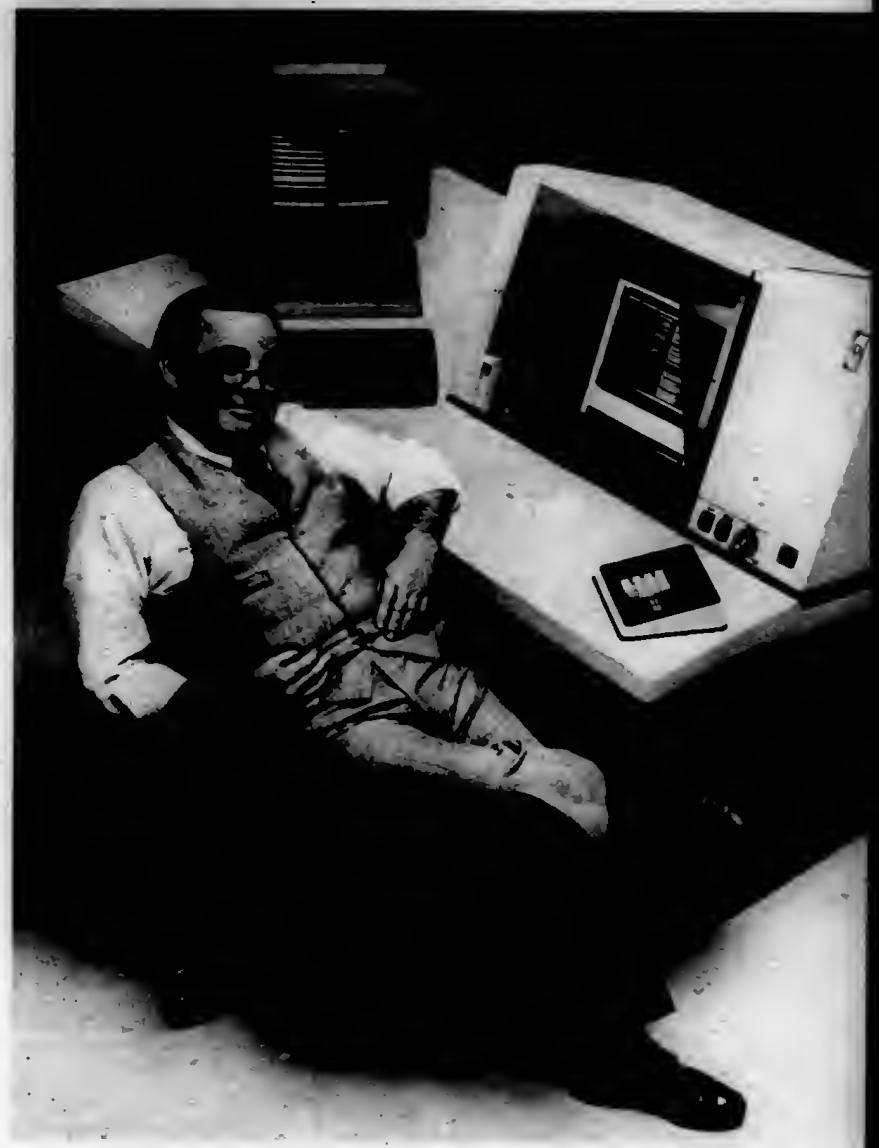

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IN DEPTH

(Continued from In Depth/14)
to Alsing the logical choice for the job: "He was the smartest guy around." But Alsing was very surprised that West wanted the position.

As Alsing remembered, West was told in effect that it was out of the question. West had been asked weeks before to design a piece of equipment called an IOP and he had not done a lick of work on it yet. What made him think he could run the Eclipse Group?

West went into his office then and closed the door for about seven weeks.

West and Alsing usually went out for coffee in the middle of the morning, but not now.

Alsing poked his head into West's office. "Coffee, Tom?"

"Go away, Carl," West replied.

Alsing tried on another day. Without looking up from his work, West said, in a flat, calm voice, "Get out, Alsing."

Alsing sensed that there was nothing personal in these rebuffs and he found it impossible to get angry at West. After seven weeks, West emerged, the completed design for the IOP in his hands. Little by little after that, he assumed command of the Eclipse Group. Reflecting some years later on those seven weeks of West's labor, Alsing said: "The day Tom went into his office to do the IOP was the day he started getting tough. I think it was the day when he started to care."

West still had a way of making ordinary things seem special; in this case a 32-bit Eclipse was being transformed into the occasion for an adventure. West's ardor for it seemed to spread the way his neologies did.

Convinced that Eagle would be a wart, a bag, a kludge — and suspicious that it would go the way of EGO and Victor — some of the brightest hardware engineers around expressed no interest in joining the project. Others went along, some reluctantly at first, and by the very early spring of 1978 West had gathered the makings of a team. He had Rosemarie and Alsing and about a dozen other experienced engineers.

For a time West thought that their numbers would suffice, but really they were just a cadre. It became obvious, when they started designing the "logic" of the new machine, that such a tiny group would never be able to produce a computer like this in a year. "We need more bodies," said West to Alsing.

North Carolina's leaders had assembled a large crew mainly by luring experienced engineers away from Westborough and other companies. But around this time a videotape was circulating in the basement, and it suggested another approach.

In the movie, an engineer named Seymour Cray described how his little company, located in Chippewa Falls, Wis., had come to build what are generally acknowledged to be tha fastest computers in the world, the quintessential number-crunchers. Cray was a legend in computers, and in the movie Cray said that he liked to hire inexperienced engineers, right out of school, because they do not usually know what's supposed to be impossible.

West liked that idea. He also realized, of course, that new graduates command smaller salaries than experienced engineers. Moreover, using novices might be another way in which to disguise his team's real intentions. Who would believe that a bunch of completely inexperienced engineers could produce a major CPU to rival North Carolina's?

"Shall we hire kids, Alsing?" said West. For a couple of weeks he and Alsing discussed the idea. To make it work they'd have to hire the very best new engineers they could find, ones who would know more about the state of the art in computers than they did. They told each other that they'd have to be sure not to turn away candidates just because the youngsters made them feel old and obsolete.

Smiling, West allowed that if they did this, they might be hiring their own replacements — their own assassins. Even if they did hire prodigies, of course, the scheme might not work. Maybe you couldn't build a major CPU with kids. It was awfully risky. It was a compelling idea.

To be continued next week.

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For Avionics and Instrumentation

Boeing Uses Desktop Unit to Test 747s

By Philip C. Ebert
Special to CW

RENTON, Wash. — Boeing Commercial Aircraft Co. has designed the first automatic system for testing the avionics and instrumentation of its 747 jets. Controlled by a desktop computer aystem, the tester includes an array of intelligent instruments interfaced to a standard bus. It is expected to save money while improving test procedures.

Called the Semiautomatic Functional Test System, the firm'a manufacturing research and development section developed the unit to reduce the 20-day cycle between assembly and flight testing of 747a. Boeing also wanted to improve test repeatability by eliminating operator yariations to allow dynamic testing of avionics and to replace cumbersome manual test methods.

The Semiautomatic Functional Test System

First Target

The first target of this automated aystem was to automate testing of the autopilot system. This involved the 747 inertial navigation system (INS) tilt table, which is used to test the INS of the 747 by physically tilting the unit in the plane. Boeing can now do it electronically with a few aimple commands and software routines, a spokesman said.

Boeing's flight line tester consists of a number of programmable intelligent test and monitoring instruments interfaced to a Hewlett-Packard Co. Series 9800, Syatem 45 desktop computer. Commands to program the instruments and data from monitoring instruments are carried over two Hewlett-Packard HP-IB buses.

The HP-IB buses, which are Hewlett-Packard's implementation of the IEEE-488-1978 bus atandard, enabled Boeing'a engineers to combine a variety of 488-compatible instrumenta from HP and other manufacturers into a complete system.

In operation, the tester, including the System 45, is loaded into the cargo bay of the 747 to be tested. Power connections are made to the plane's 400Hz source. Hoses from the flight line tester's pumps are then attached to the jet'a altitude and airapeed sensor aystems.

Electronic wiring from the tester is also hooked up to some of the 800 test points in the plane's avionics system. Yet other wiring is stretched outside the plane and connected to antennae, which will beam navigational signals at the jet during testing, Boeing said.

To initiate testing, an operator in the cockpit aimply enters commands on a hand-held terminal. From there, the System 45 takes over: It decodes the commands, formats CALL statements that enable the subroutines for the tests requested, executes the tests and returns the results to the operator. Individual tests or strings of tests can be conducted in this way, the firm said.

The tester lets the firm evaluate more than one group of instruments at a time — it lets Boeing test some or all of the instrumentation as a system. In addition, the firm can now conduct dynamic tests. Previously, if it wanted to test the air data system, for example, it had to generate a series of static pressures for the altimeters. According to Boeing, now it can generate a constantly changing altitude to more closely simulate the actual conditions to flight.

Besides being able to simulate different altitudes and airspeeds, Boeing'a flight line tester generates all signals necessary to verify the accuracy of cockpit naviga-

(Continued on Page 56)

Controllers Debut for Series/1

TUSTIN, Calif. — A magnetic tape controller and two disk controllers, all with microprocessor technology, are being offered by Western Peripherals, a diviaion of Wespercorp.

The TC-110 is the first single-board embedded NRZI magnetic tape controller deaigned for the IBM Series/1 computer, according to the vendor. The TC-110 interfaces the Series/1 via the processor I/O channel and is operating system software-tranaparent to the IBM 4969 magnetic tape aubsystem. A second embedded dual-density capability, the firm said. Capable of controlling up to four drives, it can handle a mix of any two speeds in the range of 25- to 125-in./sec.

The DC-251 ia a aingle quad-board embedded storage module device (SMD) disk controller for use with Digital Equipment Corp'a. LSI-11 computers. The controller mounts in any quad Qbus slot and emulates the DEC RM02 disk aubsystem with up to two drives. Totally software-transparent to the DEC RM02 subsystem when using 80M-byte drives, each drive port of the DC-251 haa individual drive sizing switches that allow a mixed connection to drives having from 40M- to 675M-byte capacity.

The DC-221 is a high-performance, single-board embedded disk controller that emulates the Data General Corp. Zebra 606X series disk subsystems. Up to four drives, with capacities of 40M- to 675M bytes each, can be connected to the DC-221. A two-sector "ping-pong" data buffer, combined with the DG computers' high bus band width and a user-selectable direct memory access rate switch, allows the user to tune the subsystem for optimum performance, according to the vendor.

The TC-110 NRZI controller costs $2,650 and the dual-density version costs $3,610. The DC-251 costs $2,950 and the DC-221 sells for $3,300. All include maintenance and operation manuals and diagnostics, along with the cable sets for the first drive. Western Peripherals ia at 14321 New Myford Road, Tustin, Calif. 92680.

PDP-11/34s Get Megabox Unit

IRVINE, Calif. — Megabox, a hardware/software alternative for Digital Equipment Corp. PDP-11/34 users, which permits expansion of the 11/34 main memory up to 4M bytes in existing RSTS/E systems, is being introduced by Able Computer.

Megabox increases system throughput and results in performance limited only by CPU speed, according to the vendor. It is implemented by an RSTS/E autopatch procedure both supplied and supported by Able. An on-board LED display provides information relative to address, direct memory access activity and Enable Control operating conditions.

Megabox ia a 5¼-in. chassis containing Enable Control, a bus isolator, up to six memory modules, an optional 8K-byte Enable cache memory and unbundled software. Enable Control provides the necessary control and is connected to the processor by standard Unibus cable.

To utilize Megabox, a potential user must be capable of system generation and be able to install software patches and drivers. Users will need an existing PDP-11/34 system and an RSTS/E Version 7, Class A license, the vendor said. Megabox, including cache memory, costs $11,000 from the firm at 1751 Langley Ave., Irvine Calif. 92714.

Boeing Designs Automatic Testing for 747s

(Continued from Page 55)

tional and directional systems. To test the compass systems, for instance, it can simulate the 800 kHz compass signal produced by the plane's magnetic flux valves.

Other signals are generated to test the VHF omni range (VOR) radar system, instrument landing system (ILS), air traffic control (ATC) system, distance measuring equipment (DME), including the low-range radio altimeter (LRRA) system and inertial navigation system (INS), including triple-redundant simulation of the INS inertial map system, Boeing said.

By monitoring the output of cockpit instruments during simulation, the desktop computer system is able to rate performance. Where necessary, the System 45 will also interrogate the operator for visual confirmation of cockpit displayed results that cannot be remotely measured, according to Boeing.

To simplify loading, the entire flight line test system was constructed in a four-tier rack.

Added Features

In addition to a Hewlett-Packard System 45 with 320K bytes of internal random-access memory and two 2.3K-byte tape drives, the tester includes an HP 9878 I/O expander, two IEEE 488 interface buses, an HP 9885M floppy disk drive with a built-in controller, a real-time clock and special enhanced-Basic read-only memories for control of I/O operations on the IEEE 488 buses, Boeing said.

A hand-held terminal is interfaced to the System 45's RS-232C bus via a 50-ft extension cable, allowing Boeing operators to communicate with the system from the cockpit. This terminal has a 4-char. by 20-char. display with a 1,000-char. memory buffer scroll. Terminal operation is fully controlled by the System 45, which generates the screen, according to Boeing.

Intelligent Devices

A host of intelligent devices are interfaced to the two IEEE 488 buses. Devices used for simulation, including magnetic heading, INS and LRRA simulators, a pressure controller, vacuum and pressure pumps, and VOR/ILS and ATC/DME generators, are remotely programmed over the IEEE 488 bus by the System 45, the company said.

Sensing and test devices, including an HP 3490A digital multimeter, a phase-angle voltmeter, and three angle-position indicators, are programmed by and send data to the System 45 over the bus, according to Boeing.

Matrix Switch

An intelligent switch matrix is also interfaced to one of the IEEE 488 buses. The matrix, which was designed by Boeing from a manufacturer's modular components, can be programmed via the bus to connect or test instruments with any of 800 avionics sensor locations on a 747, the company said.

Data from these sensors and instruments is carried back to the desktop computer system on the IEEE 488 bus, Boeing said.

Ebert is a specialist in the Functional Test Manufacturing Research and Development department at Boeing Commercial Airplane Company.

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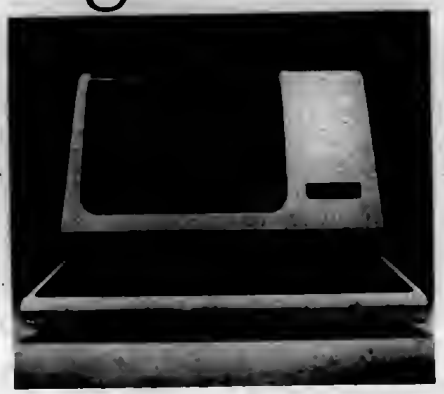
Xerox Computer Services is now marketing Praxa Software—proven applications software for manufacturers and distributors specifically designed to run on in-house Digital PDP-11 and VAX hardware.



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Emulex Beefs Up Compatibility

SANTA ANA, Calif. — Emulex Corp. has announced three enhancements to its line of Digital Equipment Corp.-compatible products.

The CS11/750 communications multiplexer, the SC21/V disk controller and TC11/V tape controller were announced for users of DEC's VAX-11/780 and VAX-11/750 processors.

The CS11/HV uses a standard Emulex CS11 series multiplexer with microcode that emulates the DEC DH11 in a VAX-11 environment.

CS11 Features

The multiplexer provides all the general features of the CS11 family including DMA on transmit operations, standard 64-byte Fifo input with an optional 128-byte Fifo, current loop and RS-232 line interfaces, according to the company.

The unit can transmit at up to 19.2K bit/sec and up to 64 lines at a composite I/O rate of 50 char./sec can be handled on a single printed circuit board, the vendor said.

The SC21/V emulates the DEC RM03/05 storage subsystem and transfers data to the DEC RM03/05 storage subsystem.

Mixed Disk

Features include mixed disk drive capacities, media compatibility, four-drive storage module device interface, self-configuring drive ports, detection and correction capabilities and a self-test capability, the vendor said.

The CS11/HV costs $5,800 for a basic 16-line system. The SC21/V costs $6,000 and the TC11/V costs $3,600, the vendor said.

The software packages are included at no extra charge, the vendor said from 2001 E. Deere Ave., Santa Ana, Calif. 92705.

Survey: 25% Add WP Systems Last Year

By Ann Dooley
CW Staff

BALA CYNWYD, Pa. — Nearly 25% of the respondents in a recent word processing survey have acquired new word processing systems in the past year and more than 80% had acquired some new equipment in the last three years.

In addition, nearly one-third expect to enhance their WP systems and nearly 30% plan to link WP and DP together in the future. Respondents also indicated that more than one-half either have information processing currently in their installations or are in the planning stages of implementing an overall office automation strategy.

The inspection of the word processing arena was conducted by Advanced Office Concepts (AOC), a consulting firm. In the survey, 2,411 respondents reviewed 28 combinations of models from 17 vendors or approximately 3% of the total WP keyboards in the U.S. and Canada, according to AOC.

Respondents showed the highest amount of interest in implementing electronic mail systems (33.1%) as part of their future growth plans. Administrative support was the next most commonly expressed area of interest (29.9%), while 27.3% of those polled indicated a future WP/DP interest and 25.4% showed interest in electronic filing as part of their future plans, according to the survey results.

Important Considerations

In evaluating their systems, respondents ranked service (downtime, quality of service, response time and overall repair time) and training/support (operations manual quality, MSR support and operator training) as their most important considerations.

Most often cited as the best features of their systems were ease of use and the ability to provide good revision editing.

Vendor Model	Class	Respondents No	Respondents Vendor %	Summary Rating	Summary Rank	Price-Performance Rating	Price-Performance Rank	Replacement Rating	Replacement Rank
Adler			1.1						
SE 2000	N	20		87.9	2	3.63	3	4.00	2
AES			2.6						
Data 100 Plus	P	47		89.6	17	3.16	23	3.48	11
AM Jacquard			3.8						
Amtext 425	F	49		90.5	16	3.33	16	3.29	16
J100/500	P	20		78.4	20	3.55	6	2.24	28
Burroughs			1.5						
Redactor II	F	27		83.9	6	4.00	1	4.00	1
CPT			5.2						
8000	F	94		84.9	4	3.51	7	3.48	10
A.B. Dick			5.7						
Magna I	N	20		78.6	22	3.05	25	2.87	25
Magna II	L	46		82.0	13	3.36	18	3.40	13
Magna SL	F	37		82.6	10	3.50	8	3.48	12
Dictaphone (Artec)			1.1						
Display 2000	L	20		84.2	8	3.55	6	3.06	18
DEC			1.6						
WS 78	P	28		82.3	12	3.50	6	3.50	9
IBM			33.5						
Memory Typewriter	N	51		74.6	25	3.20	22	3.57	7
Mag Card I	N	22		66.6	26	2.71	28	3.11	18
Mag Card II/A	N	238		70.2	27	2.94	27	2.89	21
6240	N	47		72.3	26	2.98	26	2.92	20
OS6	P	250		82.3	11	3.30	20	3.60	15
Lanier			4.5						
No Problem	P	81		84.0	7	3.43	12	3.71	6
Lexitron			2.1						
1201/02/1303	P	39		86.0	3	3.49	11	3.85	5
Micom			5.2						
2000	P	55		81.7	14	3.33	17	3.84	6
2001	P	40		88.3	1	3.72	2	3.89	4
NBI			3.8						
3000 System 1/2	P	65		84.4	5	3.57	4	2.70	23
Olivetti			1.3						
TES 401/501	L	24		76.0	23	3.26	21	2.45	27
Vydec			5.8						
1400/1800	F	105		75.1	24	3.11	24	2.63	26
Wang			16.2						
WPS 8	P	32		80.2	18	3.41	13	2.67	24
WPS 20/25/30	P	214		79.0	21	3.39	14	3.35	14
OIS 125/130/140	P	49		81.3	15	3.33	18	3.94	3
Xerox			6.3						
850 Display Type	L	46		81.1	16	3.49	10	2.71	22
850/860 Page Display	F	50		63.8	9	3.37	16	3.16	17
Total		1,918	100.0	79.5	26				

N = No Display
P = Partial Page Display
F = Full Page Display
L = Partial Line Display

Ranked Vendors

AOC Chart

Vendors such as Lexitron Corp., Xerox Corp., Adler-Royal Business Machines, CPT Corp., Dictaphone Corp., Lanier Business Products, Inc. and IBM ranked particularly high in after-sale satisfaction of service and support.

On the other hand, vendors apparently need to improve their printing operations and handling of storage media — two factors that were most frequently mentioned as the worst features of a system by the respondents.

The Burroughs Corp. Redactor II earned only a 7% complaint level by the respondents. While other systems may have earned higher positive remarks, none received fewer negative ratings than this system, which was also rated first in price/performance and replacement status.

In examining the survey results, AOC cautioned users not to rely on any one single feature in system evaluation since the results could be misleading when com-

(Continued on Page 58)

Model II Expands Font Capabilities

FRANKLIN LAKES, N.J. — IBM has unveiled the Model II version of its 6670 Information Distributor that reportedly improves efficiency and offers expanded font capabilities.

In addition to all the capabilities of its predecessor, the 6670, the Model II offers increased processing speed, 9,600 bit/sec communications and enhanced throughput, the firm said. Like the 6670, the Model II can provide input to and output from a suitably programmed IBM computer over a communications line. IBM mag cards can be used to transmit information directly to a computer for processing or storage, IBM said.

The Model II can also transmit to and receive information from other 6670 Information Distributors and other IBM office system communications equipment, directly terminal-to-terminal, or through a suitably programmed host computer. Information recorded on mag cards can be electronically transmitted over either switched or leased lines.

Up to 20 fonts may reside in the Model II, including 14 communications loaded fonts, four standard fonts and two optional fonts.

The IBM 6670 Model II costs $72,500 and is available from local IBM representatives.

Look Before You Leap Before You Buy Graphics

By Alan Paller
Special to CW

In the past, many businesses "dipped their toes" into computer graphics by acquiring low-cost software and hardware without preparing formal justifications. But successful graphics systems are expensive, and selecting the wrong software and hardware can force companies to invest money twice when they could have done it right the first time.

To find out whether a proposed computer graphics system will improve corporate productivity, an executive should ask the following five questions:

1. Who will use the system?
   - What will it do for them?
   - Will it produce the quality they need?
   - Can they count on it to do the complete job or will they have to use other staff?
2. How much will it save or how much revenue will it produce?
   - Whet staff or outside contract costs can be displaced or avoided?
   - How much management time will it save?
   - How much additional revenue will it create through increased sales?
   - How much time will it save in getting a new product to market?
3. Who will manage the system?
   - Who will train users and provide technical support?
   - Who will maintain the software and hardware?
   - Who will develop the applications and maintain them?
4. How much will it cost?
   - What will the software and hardware cost over one and five-year periods?
   - How much will the central and user staff time cost to maintain, support and use the system?
5. What is the rate of return on investment and does it exceed our threshold for capital?

The answers to questions 1 and 2 are the fundamental building blocks of an effec-

(Continued on Page 62)

PE Users Gain WP Facility

DALLAS — The ACT System (GS85), a word processing facility that provides menu guidance, full-screen editor, function keys and English commands for creating, printing, maintaining and storing documents for Perkin-Elmer Corp. 32-bit users, has been introduced by National Sharegraphics, Inc.

The ACT System offers horizontal and vertical cursor movement over a full-screen display. Changes may be made at any location on the display by moving the highlighted cursor to the desired location, the vendor said.

The system acts as a segmented task under Perkin-Elmer OS/32 operating system, or under the control of Multi-Terminal Monitor. It is also compatible with standard Perkin-Elmer file conventions, the firm said.

The system requirements include a Perkin-Elmer 32-bit processor OS/32 operating system, any supported disk, any supported file Ascii keyboard entry device with a minimum of eight function keys and a minimum of 256K bytes of memory.

With two terminal interfaces, the ACT System costs $8,000. A third interface is an additional $1,000, a fourth costs $900 and additional interfaces decrease in cost by $100 until more than 10, when interfaces are added at no extra cost.

The vendor is located at Suite 190, 1949 Stemmons Freeway, Dallas, Texas 75207.

Alphacom Adds Printer With 100-Char. Daisywheel

CAMPBELL, Calif. — Alphacom, Inc. has added a letter-quality daisy printer featuring a 100-char. print wheel and providing standard word processing functions to its low-cost printer line.

Standard features of the DP 2000 daisywheel printer include proprietary, long-life 100-char. print wheel, with more special symbols than found on a standard 96-char. version and allowing several languages without print wheel changes; a font array of more than 30 faces in proportionally spaced 10, 12 and 15 pitch; four major print modes; high-speed horizontal tabulation and incremental horizontal spacing to 1/120th of an inch.

The printer is compatible in most major word processing functions and can be installed directly in applications where Ascii control codes are oriented to more expensive units, the vendor said.

Communications is provided by the standard Centronics-type 8-bit parallel interface or optional RS-232C serial and IEEE 488 parallel interfaces. The unit operates with an average bidirectional speed of 20 char./sec and handles forms up to 17-in. wide and five parts with either the standard friction feed or optional bidirectional forms tractor, according to the vendor.

With standard parallel interface, the DP 2000 costs $1,695 or $1,795 with the IEEE 488 or RS-232C. Alphacom is at 2323 S. Bascom Ave., Campbell, Calif. 95008.

Survey Tracks WP Systems

(Continued from Page 57)

pared with overall system performance.

More than 50% of the systems are being used in word processing centers and 25% are being used at secretarial desks, according to the survey. Nearly 50% of the respondents own the equipment while 34.6% lease and only 13.3% rent. Vendors supply most of the service to users (61.3%) with almost one-fourth of the service coming from dealers, according to the survey. Dealer service was rated as well as vendor service, and the reputation and qualifications of the specific local dealer were the most important considerations when looking at dealer service, according to AOC.

More than one-third of the respondents cited communications as the most popular feature of their systems. Records processing, list processing and numeric processing are each used by approximately 25% of those responding to the survey. User programmability was cited by 15% of the users and the hyphenation dictionary was cited by 12%.

About 40% of those polled have single-keyboard sites. More than 50% have between two and 10 keyboards, resulting in an average 5.5 keyboards at multiple keyboard environments. Taking the average number on order, this figure grows to 7.0%, AOC said. Among those surveyed, 13.8% had equipment on order.

Mag card devices were the most commonly used peripheral — reflecting their previous popularity, according to AOC. About 5% used peripheral printers other than daisywheels.

In examining planned spending by the users, IBM will experience the most significant growth, followed by Xerox, Vydec, Inc., Lanier, NBI, Inc. and A.B. Dick Co. Wang Laboratories, Inc. is seen as holding steady.

The word processing survey is available for $30 or as part of its yearly subscription from AOC, Suit 433, One Bala Cynwyd Plaza, Bala Cynwyd, Pa. 19004.

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Boston	WXNE	25	Wed.	10:30 PM
Washington, DC	WDCA	20	Saturday	12:00 Mid.
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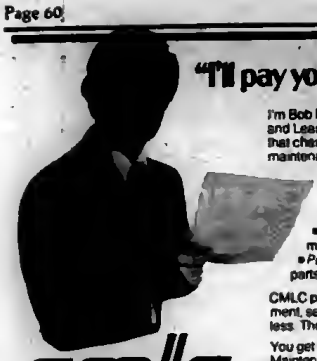

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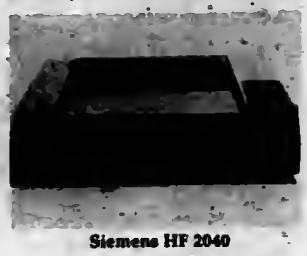
Siemens Unveils Ink-Jet Printer For Plain-Paper Phone Line Fax

ISELIN, N.J. — An ink-jet facsimile printer that uses plain paper, transmits via telephone lines in a two or three minute format and is compatible with all CCITT Group II printers is being offered by the Data Communications Division of Siemens Corp.

Transmission time can be shortened by limiting the transition format and page size can be reduced with one stroke, the firm said. The HF 2040 uses single 8½- by 11-in. sheets instead of roll paper and the ink supply lasts for about 2,000 pages, the vendor said.

Push-button operated, the HF 2040 was designed for installations where usage requirements are less critical than those that would be serviced by its predecessor, the HF 2050, Siemens said.



Siemens HF 2040

The cost of the HF 2040 is approximately $3,200, about half that of the HF 2050. The Data Communications Division of Siemens can be reached through P.O. Box 1000, Iselin, N.J. 08830.

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Registration for the four-day conference and exposition (January 12-15), including daily lunch and beverages in the exhibit area, is $395 until December 7 (then $445). It includes a special EXTRA: 15 sessions on electronic mail and office communications (EM/OC).

Admission to the EM/OC series only (January 14-15) is $245.

For Monday's series of professional skills classes, "In-Depth," taught by leading educators, the cost is $245, including lunch and text.

Registration may be made by *calling toll-free 1-800-225-4698* (in Mass., 617-879-0700) and asking for Mrs. Louise Myerow, Registration Coordinator, or Terri Hamilton, Exhibit Sales.

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System Handles Letters of Credit

NEW YORK — An Electronic Letter of Credit Import/Export System (Elcie), which provides for the issuance, amendment adjustment and acceptance processing of letters of credit, is now being offered to major financial institutions by its developer, Complex Systems, Inc.

Based on IBM System/34 and 4300 systems, Elcie features include full Telex interface for both incoming and outgoing cables, cable forms, offering tickets, customer debit/credit advices and checks, according to the vendor.

Major system modules include a data capture subsystem, extensive inquiry subsystem, a word processing subsystem and an accounting subsystem capable of interfacing to other bank accounting and liability systems and maintenance of the letter of credit department's own books.

A typical system without customization costs approximately $250,000, the firm said from 475 Park Ave. S., New York, N.Y. 10016.

Sci-Tech Offers Personal System

MOUNT VERNON, N.Y. — A personal computer and word processor that handles business controls such as accounts payable and receivable, inventory, payroll, taxes, general ledger and word processing functions is being offered by Sci-Tech, a division of Signo Trading International Ltd.

Available in English, French and Arabic, with software programs available for financial, medical, security, construction, legal, production and transportation applications, the system features flexibility, according to the firm. Storage capacity consists of four 1M-byte floppy disks and hard disks of 10M bytes, 30M bytes or 80M bytes are also available.

The Sci-Tech computer costs between $8,000 and $25,000 from the firm at 208 S. 14th Ave., Mount Vernon, N.Y. 10550.

Word/3, MLS/3 Offered For IBM 5110/5120 Users

WOODLAND HILLS, Calif. — Word/3, a diskette-based software package, and MLS/3, a file management package, are being offered by Option/1 Systems to IBM 5110/5120 users.

Word/3 provides internal math capability as well as tasks such as repetitive form letters with personalized names, addresses and messages; standard documents assembled from stored paragraphs; letters, documents and reports with automatic math calculations; and printed forms with blanks automatically filled in.

Data can be extracted from external files and automatically merged into the word processing system.

In addition to the conventional word processing capabilities, the software features statistical column move; move text to a different part of the document; and copy text in a different location while retaining the text in its original position. Pagination, centering and page numbering are automatically produced when printing a document. A variety of printers can work with the Word/3 - 5110/4120 combination, according to the firm.

Word/3 costs $2,000 and MLS/3 costs $1,500 from the firm at 22102 Clarendon St., Woodland Hills, Calif. 91367.

WP Update Fits System/34

CLEARWATER, Fla. — Oak Software, Inc. has enhanced its word processing package for IBM System/34 users by adding math functions and a universal file interface.

The math functions allow colomns of numbers to be entered free-form using the full-screen, full-function text editor supplied with the system. The columns will then be automatically aligned and formatted, the firm said. The Universal File Interface allows data from any of the user's data files to be used by the WP system.

The package costs $2,500 and includes all programs and procedures, a 220 page user manual and training course and phone support from the firm at Suite 296, 300 S. Duncan Ave., Clearwater, Fla. 33515.

Dictionary Tool Gets Update

LANSING, Mich. — Release 2 of the Computerized Dictionary software package that runs under the Flex operating system is being offered by Davidson Software Systems.

This faster version of Release 1 reportedly highlights and automatically changes misspelled words. Two modes for examining text information are available: interactive, in which any words not found in the dictionary file are displayed; and list mode, in which the text is printed or displayed as it is being processed.

A full page of text can be edited in 3.5 min, the firm claimed. A dictionary file is included with the programs, although the user can add words at any time.

With an installation guide and operations manual, the package has a one time fee of $100. Current licensees may receive Release 2 for a $25 shipping charge. The firm can be reached at P.O. Box 21002, Lansing, Mich. 48909.

ISI Tools Access Science Literature

PHILADELPHIA — A package of information tools that provides access to the core literature in the fields of math, statistics, computer science and operations research on a time-sharing basis is available from the Institute for Scientific Information (ISI).

Called ISI/Compumath, the package consists of three components. The first part is ISI/Compumath, an on-line data base covering the literature from 1976, which will be accessed through the ISI Search Network via Telenet Corp.'s network.

The second part is "Current Contents/Compumath," a monthly publication that reproduces contents of recent issues of journals.

The third part is the Compumath Citation Index Cumulation covering the years 1976 to 1980.

The data base can be searched by author's name, title words, cited references, source journal, year of publication, author's affiliation, document type and language.

Subscription costs $750/year. The on-line data base will be available only to subscribers. Additional copies of "Current Contents/Compumath" will cost subscribers $125/year and the 1976 to 1980 Compumath/Citation Index Cumulation will be offered separately for $2,000. ISI is at 3501 Market St., University City Science Center, Philadelphia, Pa. 19104.

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Look Before You Leap Before You Buy Graphics

(Continued from Page 57)

tive justification of business graphics systems. Honest answers to questions 3 and 4 will help avoid two of the most common errors made in the name of efficiency:

Error 1: "Buy it because it is cheap." The error is that the organization did not fully answer Question 4. They forgot to ask how much they should spend using it. A cheap system may cost more than an expensive one when the staff time is included in the cost.

Error 2: "Do not let end users (especially secretaries) make charts themselves." If central staff are needed to design and produce all the computer-generated charts, then the costs of central staff have to be added to the cost of end-user staff overseeing the process. On the other hand, if end users make their own charts, the load on the central staff is lightened and the number of hours needed because the "client changed his/her mind" are reduced.

To prepare a cost justification, start by identifying the high-payoff applications. To find the best applications, you need to show senior managers in finance, sales, marketing, manufacturing, decision support and public affairs.

Next Steps

Once you have identified high-payoff applications, you have the knowledge needed to take the next two steps:

- Estimate the financial benefits to be gained from each application.
- Decide which hardware/software combinations will meet 150% of the requirements identified and determine the costs of hardware/software and support staff needed.

You may be frustrated by your inability to make precise estimates of savings to be gained, but you need not experience such frustration.

Here are e few pointers on making the estimates of savings:

- Count executive time saved by reviewing charts rather than listings (20% to 30% is a conservative estimate).
- Count the time saved by climinating the need for analysts and executives to review charts end slides produced manually to detect possible errors.
- Count direct savings in chart production costs.
- Count savings in costs as additional cherts and slides are required, since no additional staff will be needed.
- Estimate savings from reduced project completion times through better presentations and more complete comprehension by management.
- Estimate competitive advantages of increased sales and resulting profits from more effective presentation of information to clients.
- Estimate savings and profits from identifying opportunities for improved management effectiveness.

Once you have estimated savings, you will need to estimate costs. That will turn out to be a difficult job if you include the cost of support and user staff in your estimates.

For your own justification, you should have three cost scenarios. The first should be sufficient to meet the needs of specific users identified in your cost justification. The second should assume a moderate degree of success in getting additional users, and the third should assume even more success.

Here is a pointer on making your cost estimates:

- Suppliers will cost 30% to 50% of the rental cost of graphics hard-copy equipment.

Paller is president of AUI Data Graphics in Washington, D.C.

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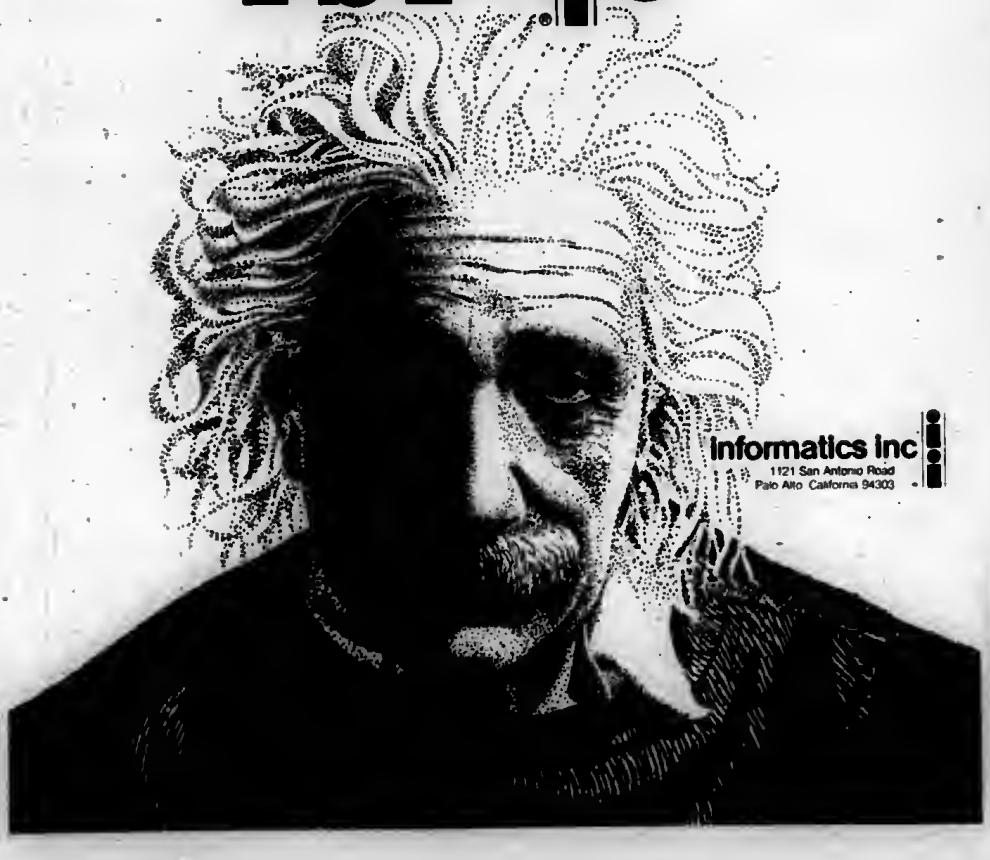

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TEXAS INSTRUMENTS
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WP Boosts Firm's Documentation Output

ROCHESTER, N.Y. — Adding word processing software to its already installed hardware enabled Rochester Gas & Electric Corp. (RG&E) to generate more documents even while it cut paperwork handling time "to a minimum."

The package was installed to bridge the gap between solving engineering problems within RG&E's Engineering Computing Service Group and producing the reports, memos, schedules and letters that are an inevitable result of this problem-solving. Integrating the WP and DP systems has "increased our production so that we can still handle other routine work," explained Margaret Fenlon, who heads up the WP department.

"In the past two months we've produced more than 5,000 documents — something that we never could have handled before without stopping other work," she said.

Nick of Time

The WP capability arrived in the nick of time — like the cavalry, Fenlon continued. "Our operators work right alongside the 90 or so engineers in this department. Five people now handle all of the typing production and we've reduced our typical turnaround time from one to two days to under two hours," she claimed.

RG&E's time-sharing system was set up on a Data General Corp. Eclipse C330 a few years ago to provide a tool for the engineers who would help solve daily work problems, a spokesman recalled. The only hitch was that, as solutions and program plans were prepared on the computer, a "tremendous data entry job was created for production of finished documents on the company's stand-alone WP equipment."

As the engineering staff grew in size and productivity increased arithmetically, there was almost a geometric increase in WP work load for the three IBM OS/6 systems that had been operating since 1977.

Rather than simply add more word processors and train additional operators, RG&E's solution was to add WP capability to the Eclipse system so that the data base created by engineering users could be employed directly in document creation, he explained.

The WP package came from Satellite Software International (SSI) of Orem, Utah. The 1M-byte C330 controls two 2M-byte fixed-head disks, three moving-head disks with a total capacity of 500M bytes, a 600 line/min printer and two tape drives. It also handles six synchronous and 48 asynchronous communications lines tied to terminals and printers distributed throughout multiple plant locations via dial-up, local hard-wired and leased-line modes, RG&E said.

"Applications range from day-to-day warehouse inventory to electrical distribution modeling, construction scheduling, nuclear reactor physics modeling and plain old engineering problem solving.

"While we put a reasonable limit on the amount of memory or storage that any one user can take up at any given time, there is, for all practical purposes, unlimited capacity there for anyone to use," he continued.

Overload Situation

Although the system was highly productive, standard computer printers simply could not handle much of the output, according to another representative from the firm. The output included engineering results prepared in the form of letters, memos and other one-time documents that used to be typed by secretaries, he said.

After the OS/6 systems took over this task, everyone in the company began using the WP capability, which resulted in an overload situation, Bob Rathke, senior systems analyst, said.

"We decided to look for a software package compatible with the Eclipse system in order to add more CRT [terminals] to the network," Rathke said. "Since we had the system capacity to accommodate more terminals, this seemed to be a justifiable decision."

The evaluation encompassed a number of software packages including DG's product, according to Rathke. Eventually, the firm decided on SSI's WP software because it was usable on any DG CPU and with any operating system. Therefore, the package could be expanded to keep pace with company growth.

The package interfaces with the DP applications already being handled by most end users, a spokesman noted. Memory requirements under the AOS operating system used by RG&E amount to 14 shared pages and five unshared pages with each equaling 2K bytes.

Standard WP functions include unlimited text entry and deletion, automatic formatting, boldface print, automatic repagination, text search and range capability, superscript and subscript, document filing and retrieval, automatic hyphenation and a merge/document assembly capability, he continued.

Rathke also credited SSI's package with easy installation. "It's one of the most trouble-free software packages I've seen." Although written entirely in Assembler, he maintained that the vendor had "taken it to the nth degree" in terms of thoroughness.

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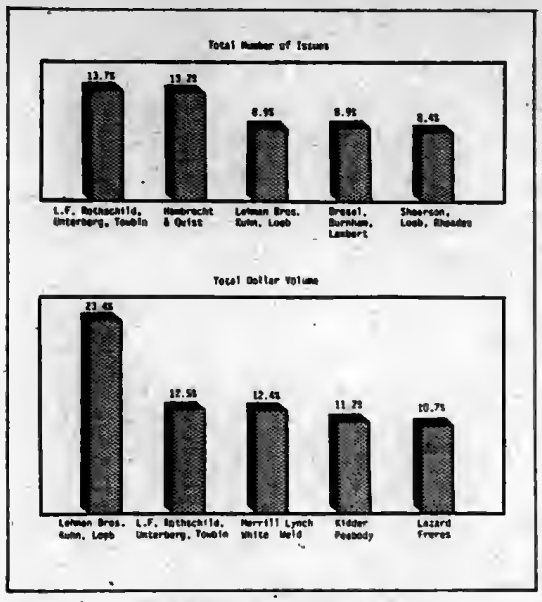

Managers of Equity Offerings

Check Broker's Record, VDC Study Warns

WELLESLEY, Mass. — Computer firms seeking financing in the equity market often select investment bankers who have a prestigious image, but these companies should examine the investment firm's track record in the industry, according to a comprehensive study recently released by Venture Development Corp. (VDC) here.

Last year was a landmark year for equity issues in the electronics industry, with 200 issues underwritten, raising about $6 billion in capital. By comparison, in 1979 there were about 70 new issues, which cumulatively raised about $4 billion.

Apple Computer, Inc., one of the hottest issues last year, heaped a lot of attention on Morgan Stanley & Co., but Hambrecht & Quist, the offering's comanager, is one of the top underwriting firms for electronics issues.

None of the top five ranking firms, in terms of the number of issues managed, made it to the top five for electronics issues, the report revealed.

Of the 40 firms studied, Lehman Bros. Kuhn, Loeb took first place for the total dollar volume raised, including the $400 million offering by Digital Equipment Corp. This firm was lead manager or comanager for 23.4% of the more than $6 billion raised.

L.F. Rothschild, Unterberg, Towbin beat out by a hair Hambrecht & Quist for the total number of issues handled — 13.7% and 13.2%, respectively (see chart).

The top five underwriters accounted for 53% of the total number of electronics issues managed, while in terms of dollar volume the top five raised 70% of capital.

The 330-page study provides various rankings for investment bankers and proposes strategies to help high-technology companies choose the investment banker most suitable for their needs. The report is priced at $2,250. More information may be obtained from VDC at One Washington St., Wellesley, Mass. 02181.

DEC Earnings Rise 38%

MAYNARD, Mass. — Digital Equipment Corp. (DEC) finished its 1981 fiscal year with a 35% increase in revenues and a 38% increase in earnings.

For its fiscal year DEC's revenues climbed to $3.2 billion, up from $2.4 billion for the prior year.

Earnings reached $343.3 million or $6.70 per share, up from $249.9 million or $5.45 per share a year ago.

Fourth quarter earnings topped $116.9 million or $2.19 per share, up nearly 40% from the $83.8 million or $1.73 per share in the final quarter of 1980's fiscal year.

Revenue reached $938 million, up from $699.3 million in the same quarter a year ago.

Despite the healthy performance, the firm as usual said it remained "cautiously optimistic" for fiscal 1982.

During the year the firm spent nearly $400 million on new plant construction and equipment, which helped reduce lead times for some products, the firm said.

To date, DEC has shipped more than 305,000 computers.

Japanese Chip Makers Pressure U.S. Firms

CAMBRIDGE, Mass. — The increasing strength of the Japanese in the semiconductor industry is making it necessary for leading U.S. chip makers to vertically integrate into the computer systems business.

Other integrated circuit makers are solidifying their positions by being acquired by large users of chips or by establishing a niche in the industry to avoid the stress of having to produce a broad line of off-the-shelf devices, according to a recent industry survey by The Yankee Group.

Driving this trend among chip makers is the high capital equipment costs — now about 12% to 17% of revenues and expected to go to 20% within the next three to five years as manufacturers switch over to very large-scale integrated devices, the survey noted.

Moreover, the Japanese will continue to make inroads into the U.S. and world markets as they set up U.S.-based production facilities. Today the Japanese hold about 25% of the world market, and the Yankee Group forecast these offshore competitors could hold 40% of the market by 1985.

Digital Circuits

Digital integrated circuits accounted for 55% of the $13.6 billion 1980 total semiconductor market. Random-access memories (RAM) constituted about two thirds of the $3.3 billion memory segment.

The study forecast the market for semiconductor devices will be $38 billion by 1985, sustaining an average annual growth rate of 22%. Some 50% to 60% of these devices will be used in information or communications-related systems.

By 1982 the 64K-bit dynamic RAM market, now 11% of the RAM market, will eclipse 16K-bit devices and by 1985 will generate sales of up to $1.5 billion.

To remain competitive, U.S. chip makers are increasingly investing in automated design and assembly systems to narrow the perceived quality edge held by the Japanese.

Vendors of information delivery systems have also realized the importance of producing their own integrated circuits. These firms have made vertical integration of their products a primary objective of their corporate strategy.

(Continued on Page 68)

CAD Facility Opens Door

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — Motorola Semiconductor Products, Inc. has opened its first regional computer-aided design (CAD) facility to give the company's Macrocell Array customers an alternative means of designing their own custom bipolar logic circuits.

The center offers users anywhere from two days to six weeks of CAD training and houses an assortment of on-line I/O modules that allow logic designers to use Motorola's central mainframe in Phoenix as an engineering-oriented time-sharing service.

Through the center's Tektronix, Inc. 4014-1 graphics display unit and its General Electric Co. Terminet 2030 printer terminals, engineers can gain

(Continued on Page 68)

Tech Writing Effort Aims at End Users

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — A new project designed to provide nontechnical end users with a greater understanding of how their systems operate is being introduced by Lamda Technology, Inc.

The information processing consultant, recently taken over by Geisco, is starting up a technical writing project in the Bay Area in a bid to improve communications between data processing professionals and end users.

To carry out the project, Lamda has hired a group of media professionals who are familiar with the computer industry. Their job will be to provide client end-user departments with written documentation and graphics presentations of how their systems operate.

Bruce Anderson, marketing manager for Lamda, told *Computerworld:* "Data processing professionals know how to build a system, but they can't communicate their ideas in writing to non-DP people. The problem is when a system is built, how do you communicate about it to people who are going to have to use the system?"

Anderson said the media support service would provide users with an easily understood manual containing an operator's guide on how to use the system and an administrative guide on how managers should interpret the information the machine gives out — interpreting industry trends from reports.

A pilot scheme has already

(Continued on Page 67)

8

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Tech Writing Effort Aims at End Users

(Continued from Page 65)

been carried out in New Jersey and Lamda said it expected the service to be up and running in the San Francisco area within a month with the first client likely to be in the telecommunications field. Communications companies, banks, local government and the media are reputed to have taken advantage of the service in New Jersey.

"MIS departments have not developed technical writing skills and they show no inclination to do so. DP departments know there is a problem in this area, but they have no idea how to solve it. They would rather sit around and say their DP people don't know how to write!" Anderson added.

The marketing manager also attacked professional associations in the industry for failing to provide DP professionals with the type of information they require. One of the disturbing trends in the industry, he said, was the lack of information available to motivated MIS professionals.

"It is not easy for MIS people to get information they need, such as developing trends or significant developments in the industry, such as the emergence of the 'information center,' voice recognition or software engineering," Anderson said.

Bodies such as the Data Processing Managers Association and the Association of Computing Analysts had the capability to provide such a service, but, Anderson said, they were failing to do so. As a result Lamda has begun a series of special seminars to highlight some of the topics not ordinarily covered.

Anderson claimed that the industry trend likely to have the biggest impact for DP professionals over the next few years was the trend towards increasing specialist skills.

To keep large numbers of specialist DP professionals in one company is proving too expensive, he said, because these people have a lot of idle time on their hands between dealing with one specialist project and the next.

This is also frustrating for the DP professional and so, Anderson asserted, more and more of them would go to work for consultancy-type enterprises that had the ability to move them from one specialist project to another consistently.

"What the MIS professional wants is to use his abilities as a specialist. So when a user needs something new he will go to companies which have that specialist expertise on hand. This is already happening in the Bay area, where there is such a shortage of skilled personnel. "As a result, end users will retain a smaller DP staff in areas like product management and development than they do now," Anderson said.

But he warned that the trend toward the growth of information processing consultancies and development companies also posed dangers for the industry. There was a lack of control about who could set up a DP consultancy.

"The hiring climate in the Bay area makes it easy to become a consultant without being properly trained because of the tremendous need for DP staff.

"Often these consultants come together to work jointly on a project and then go their separate ways, making for little continuity in developing systems." Anderson said this trend meant there was a lot of reinvention of the wheel going on.

Nevertheless, Lamda claimed, the rise of independent consultants could provide substantial benefits for end users, with specialist DP professionals able to take over the entire planning of a new facility for a user if need be. Anderson added: "Usually this will happen when a company wants to change vendors and it represents a major change in direction or concept, particularly if the new equipment is something with which it had little previous experience.

Lamda is a $32 million company with 780 employees in eight U.S. cities and London. Its headquarters are located at 405 Lexington Ave., New York, N.Y. 10174.

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RANK (1980)	COMPANY	1980 IC SALES ($M)	1981 IC SALES ($M)
1	TEXAS INSTRUMENTS	1020	1105
2	MOTOROLA	650	755
3	INTEL	600	655
4	NATIONAL SEMICONDUCTOR	585	635
5	FAIRCHILD	410	445
6	NIPPON ELECTRIC (NEC)	377	420
7	SIGNETICS	320	350
8	ADVANCED MICRO DEVICES (AMD)	280	305
9	HITACHI	275	300
10	MOSTEK	270	295

Yankee Group Chart

Japanese Put Pressure on U.S. Firms

(Continued from Page 65)

As a result of such vertical integration, vendors are able to develop proprietary products and enhancements based upon internally developed chips.

This could open the development of more advanced information components, which in turn will contribute to the production of more innovative systems, the study concluded.

The study, "The Impact of Semiconductor Technology on Information Delivery Systems," is part of the research firm's Communications/Information System program, the company said.

The Yankee Group can be reached through P.O. Box 43, Harvard Square, Cambridge, Mass. 02138.

Motorola CAD Center Assists Logic Designers

(Continued from Page 65)

remote access to a mainframe stored library of macrocell devices and design routines, from which users can then develop circuit layouts and select a chip's electronic components.

After the remote processor automatically interconnects the constituent circuit devices, Motorola converts the resulting chip "blueprints" into finished products, which the company then fully tests before shipping to its users.

Small Vendors

Demand for the Motorola center's services will come primarily from small vendors that lack the financial wherewithal to maintain their own CAD hardware in-house.

The facility will particularly appeal to manufacturers of high-volume products like microcomputers and peripherals, according to William Blood Jr., the semiconductor supplier's manager of bipolar large-scale integrated (LSI) engineering.

Although the CAD center has been formally open for business only since July 17, plans for other such facilities elsewhere in the U.S. are already well under way, the firm said.

The next addition to the company's proposed network of regional CAD sites is slated to make its debut soon in the Boston area and will be followed during the next two years by the appearance of eight comparable installations, each patterned closely after the original one here, according to Motorola's Design Centers Manager Link Young.

The locations of Motorola's subsequent CAD facilities will correspond to the major centers of the U.S.' high-technology business, the most important single part of which lies right here in Silicon Valley.

This city's extreme proximity to Silicon Valley — and its large potential market for computer-aided circuit design — goes a long way toward explaining why the company chose Northern California as the site for its first center, Young explained.

Equipped to support both LSI and very large-scale integrated (VLSI) circuit development, the first of Motorola's 10 regional CAD centers houses five private design cubicles and one common work room, which contains a 4014-1 graphics terminal and a Tektronix 4663 flatbed plotter.

Design Features

Each of the separate design cubicles is equipped with a Terminet 2030 printer terminal, which communicates over 9,600-bit/sec telephone lines to Motorola's remote host mainframe, an IBM 3033 running under TSO.

Except for generating graphics and retrieving schematics — functions that have to be performed in the common work area — engineers can design an entire LSI or VLSI bipolar logic circuit without ever once leaving the confines of their enclosed cubicles, Blood said.

Depending on the volume of use, the average cost of subscribing to the CAD center's services ranges from $3,500 to $5,500 per circuit design.

More information about the facility is available from Motorola at Box 2953, Phoenix, Ariz. 85062.

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Contracts & Pacts

University Computing Co. will market a range of their systems software products in Japan through a licensing agreement with Computer Applications Co., Ltd., Tokyo.

Rotating Memory Systems, Inc. has been awarded a contract valued at more than $2 million from Xcomp, In. for RMS 506 and 512 5¼-in. Winchester disk drives.

Computing Capabilities Corp. has announced that Insight, its proprietary transaction processor for Hewlett-Packard Co.'a HP 3000 computers, is now being distributed by Hewlett-Packard in the U.S. and Canada.

Philips Information Systems, Inc. has been awarded a contract valued at more than $1 million to supply 68 information processing systems to the Army Air Force Exchange Service.

Shugart Associates signed an agreement to provide approximately $5.7 million of its 8- and 14-in. Winchester disk drives to Altos Compoter Systems, Inc. for use in multiuser microcompoter systems.

The Customer Service Division of TRW, Inc. has signed a five-year agreement with Datasystems Corp. under which TRW, Inc. will become exclusive maintenance service representative for Datasystem's line printer controllers, used with Dataproducts band, matrix and daisywheel printers.

Qantex Division of North American Industries, Inc. has awarded a field service contract for its line of dot matrix impact printers to Indeserv, Inc., a network of 225 independent service centers throughout the U.S.

Automatic Data Processing Corp. has reached agreement with The Exchange, an Automatic Teller Machine Network (ATM) service company owned by 44 financial institutions, to participate in the nationally shared ATM network.

Logicon, Inc. has received a contract modification valued at $2,595,777 to expand its technical and management support of the Naval Electronic Systems Command'a software quality assurance program.

Datawest Corp. has reached a nonexclusive manufacturing agreement with Sperry Univac Computer Division to manufacture Datawest's high-speed Model 480 Array Processor.

C3, Inc. has been awarded a $1 million cost reimbursement contract by the U.S. Navy for the performance of the Shipboard Nontactical ADP Program Benchmark Test and Capabilities Demonstration, to be performed from July 6 through Aug. 19.

Booz Allen & Hamilton, Inc. has been awarded a three-year, multimillion dollar contract for technical and management support services by the U.S. Naval Electronic Systems Command.

Printacolor Corp. has awarded a three-year, $10 million contract to Siemens Corp. to supply inkjet printer modules for its color graphics hard-copy devices.

The Customer Service Division of TRW, Inc. has been appointed exclosive maintenance service representative for Tymshare, Inc.'s Dynasty series of distributed computer systems.

Programmed Systems, Inc. (PSI) has signed an exclusive marketing agreement with Cincom Systems, tnc. to cover all Total versions of PSI's proprietary system known as the Fixed Asset Package.

Burroughs Inks $50 Million Pact

SANTA MONICA, Calif. — System Development Corp. (SDC), a division of Burroughs Corp., has been awarded a $50 million first-stage contract fo provide an airspace management system for the government of Argentina.

The contract, which Burroughs said will be carried out over the next few years, will include processors for each of Argentina's seven major airports, CRT display units, software and radar and communications facilities, a spokesman said.

The radar unit, which will not be manufactured by SDC, will provide coverage of all of Argentina's land and territorial waters.

Burroughs said it is too early to tell what processor will be used in the Argentina network. However, a spokesman said the processors would probably be developed by the firm's Federal Systems Division.

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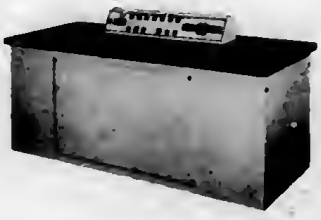

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Vision System Aimed at Factories

Machine Intelligence Eyeing Automation Mart

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — Machine Intelligence Corp., a specialist in artificial intelligence systems, is set to make a major bid for tha programmable automation market.

After two and one-half years in business and three rounds of financing, the company claimed its newly developed VS-100 vision system represents the first thrust in a concerted bid to tap an aver growing market.

Starting out with what it described as "minimal capitalization," Machina Intelligence Corp., founded by ax-researchers at SRI International, Inc., recently raised $5 million from outside sources to finance the next phase of its development plans.

"We are investing in a massiva start-up program and are getting ready to go into a high growth mode by hiring 60 people over tha next year and opening up some regional sales offices with tha first targeted for Chicago," Arthur Lasch, the company's president, said in a recent interview here.

At present tha company employs 23 peopla. "Wa are going to gat into the programmabla automation business. It seems to be the most easily identifiabla market at present and we expect to becoma a major force in that area," Lasch added.

The reasoning behind the company's present focus is persuasive. According to Lasch, the potential market is big with approximately 100,000 prospective customers in the U.S. alone as computer-controlled robots with vision systems coma to take on more and more of tha tasks currently performed by people. This, he said, would represent a $1 billion market over tha next 10 years.

In Europe, Machina Intelligence Corp. said it expected even bigger pickings because tha infrastructure to support programmable automation technology was more prevalant there since most of tha minicomputer technology was moved onto tha continent via systems houses.

"The structures that we need in order to do business are more prevalant in Europe than tha U.S. Our approach here will be different. The ingredient that is missing in the U.S. is that most systems houses are more mechanically orianted than geared toward computer control and so wa need to find houses willing to invest in computer expertise," Lasch axplained.

Even large multinational companies, he said, needed the support of systams houses at the operations leval.

Vision System

The way Machine Intelligence Corp. intends to attack these markets is through its VS-100 vision system, which is attached to a Unimation Puma robot to comprise a system known as Univision. Machine Intelligance Corp. claimed that tha VS-100 is the first general purpose vision system aimed at factory automation.

"Until now, most systems were specialized for particular applications, but with our device, such as its varsatility, it is conceivable you could use it to read an IBM card," according to Lasch.

The VS-100, which runs on Digital Equipmant Corp.'s PDP-10 and LSI-1102 minicomputers, was first introduced last August with 25 machines sold to date, mostly to Fortuna 100 companies such as Proctor and Gambla and General Electric Co. Tha cost of a total Univision system is approximately $7,000.

The system uses a variety of cameras to scan objects in an industrial anvironmant. The image that the camara sees is processed by data compression hardware to locate and identify internal and external features of tha object. To do this the objects require high contrast and stable states because the system only recognizes two-dimansional profiles In addition the objects must not touch aach other, Lasch said.

Tha processed image is stored in a buffar with tha vision system processing raw information such as area, perimeter and major axes of the object.

Once these paramaters (13 in. total) hava been axtracted from the image, tha vision system compares tham with stored parameter tables to idantify the object. If it can identify it, tha system returns the object's name and the statistical certainty of the indentification.

Machine Intelligence Corp. claimed that by perfecting such techniques, a company could reap significant productivity benafits. Earl Sacerdoti, director of research and development, asserted thet by adding vision capabilities, a user could trade off expensive hardware fixtures thereby cutting down on axpensive retooling costs when changing product lines.

"Existing factories are built around peopla's sensory capabilities of what vision is the most critical. If a robot is to be truly effectiva in assembly type operations it needs to be able to at least crudely mimic human behavior," Sacerdoti said.

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Industry Mergers, Acquisitions Step Up Pace

ARLINGTON, Va. — For the first six months of this year, the computer services industry had 57 merger or acquisition transactions, a 40% increase from the same period a year ago, according to recent statistics.

The amount of cash or stock paid for these transactions increased by $80 million from $164 million in the first half of 1980 to $244 million for the comparable period this year, revealed the Association of Data Processing Service Organizations, Inc. (Adapso)/Broadview Associates Index.

Recent merger and acquisition activity has been noteworthy for the number of industry transactions. "We anticipate this trend will continue, but during the next year we should also see a number of major U.S. corporations entering the computer services industry through acquisitions," noted Bernard Goldstein, a Broadview partner.

"Looking ahead we anticipate an additional breed of acquiring companies. The new publicly owned software and processing companies now have the mandate and financial resources in terms of cash and stock to grow through acquisitions," Goldstein continued.

A recent case in point is Management Sciences America, Inc., which acquired Peachtree Software, a microcomputer software firm, and Cullinane Data Base Systems, Inc., which purchased Rath & Strong, Inc.

Besides these new entrants, large computer service companies continue to expand by acquisitons. Automatic Data Processing, Inc. and Tymshare, Inc. have both increased their holdings in banking, elelctronic funds transfer and financial services markets.

Because of the interest in this industry phenomonon, Adapso is holding a mergers and acquisitions seminar at the Grand Hyatt Hotel in New York on September 16. A second seminar on legal management will be held the following day.

Information about these programs may be obtained from Tom Fareweli at Adapso, Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

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ACR Offers Newsletter

PHOENIX — Applied Computer Research, Inc. (ACR) has announced a quarterly newsletter for those in the information industry concerned with marketing, sales and advertising.

Sources reports on products, services and publications that may be of interest to those in computer marketing areas, the publisher said.

Sources is sent free to customers, subscribers and potential subscribers to either of the vendor's directory services from Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

Marketing Expo Set in New York

NEW YORK — Computer Marketing Expo, the first of four events for regional independent computer dealers throughout the U.S., will be held at the Sheraton Centre here Sept. 1-3.

Business leaders will offer their expertise on such areas as dealing with a changing marketplace and "how-to" sessions on dealing with financing, cash flow and inventory, start-up costs, undercapitalization and selling to vertical markets.

Further information is available from Arlene Curtis, Conference Management Corp., 500 Summer St., Stamford, Conn. 06901.

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Executive Corner

• Raymond P. Kunhan has been named president of Management Assistance, Inc.'s (MAI) Basic-Four Information Systems division; and Ronald A. Wallace has been named president of MAI's Sorbus Service Division.

• Donald A. Mitchell has been named acting president of the newly formed Customer Premises Equipment organization at General Telephone and Electronics Corp.

• Ralph Gabai has been appointed chairman of the board and chief executive officer at Micro Peripherals, Inc.

• Rodger Weismann has been appointed vice-president of finance at McCormack & Dodge Corp.

• Victor J. Godlewski has been named vice-president of manufacturing in the Computer Systems Division at Harris Corp.

• Herbert S. Spivak has been elected vice-president of corporate quality assurance at Prime Computer, Inc.

• Rotating Memory Systems, Inc. has appointed John Sullivan as vice-president of finance and James Blum as vice-president of operations.

• Peter R. Lessler has been elected vice-president and general counsel at National CSS, a company of the Dun & Bradstreet Corp.

• Robert Stafford has joined Information Science, Inc. as executive vice-president.

• Computer Peripherals, Inc. has appointed R.J. Holbrook as vice-president of its Printer Products Division.

• Lawrence J. Schipper has been named division vice-president and general manager of Government Communications Systems Division at RCA Corp.

• Vista Computer, Inc. has named Michael S. Dretch vice-president in charge of software and hardware services and Clive F. Smith vice-president of the company's national marketing program.

• Melville R. Barlow has been named vice-president and general manager of the new Data Systems Division at General Dynamics Corp.

• Errol W. Bartine, C. Victor Meyer and Dieter E. A. Tannenberg have been elected corporate vice-presidents at AM International, Inc.

• Datapoint Corp. has promoted Dennis Phillips to vice-president and controller of the Customer Service Division; and David Ruberg to vice-president of software engineering in the Computer Systems Division.

• Dewaine L. Osman has been promoted to vice-president of the Commercial Systems Group at Sperry Univac.

• Chris Jesse has been appointed vice-president of product marketing at American Management Systems, Inc.

• Philip Colquhoun has been appointed vice-president of manufacturing at Nixdorf Computer Corp.

• Robert S. Fenton has been named vice-president and treasurer at Pertec Computer Corp.

• Michael A. Weiner has been named vice-president at John Diebold & Associates, a division of The Diebold Group, Inc.

• Allen D. Fleener has been appointed vice-president of marketing and James L. Bender has been appointed national sales director at Periphonics Corp.

• J. J. Murray has joined Computer Horizons Corp. as vice-president of technical operations, a newly created position.

• Computer Horizons Corp. has promoted John J. Cofone to assistant vice-president.

• Terry D. Martin has been named a vice-president at Intersil, Inc.

• Richard F. Tecca has been appointed vice-president of the customer services division at Gerber Systems Technology, Inc.

• Northwest Computer Services, Inc. has elected Frank S. Powell chairman and chief executive officer; David M. Van Lear has been named president, chief operating officer and a director; Jack W. Kent has been appointed senior vice-president of administration; and Michael J. Shade has been named senior vice-president of banking services.

• Ted L. Priem has been promoted to senior vice-president and general manager of the product business group at Comserv Corp.

• Richard C. Alberding and Franco Mariotti have been elected vice-presidents at Hewlett-Packard Co.

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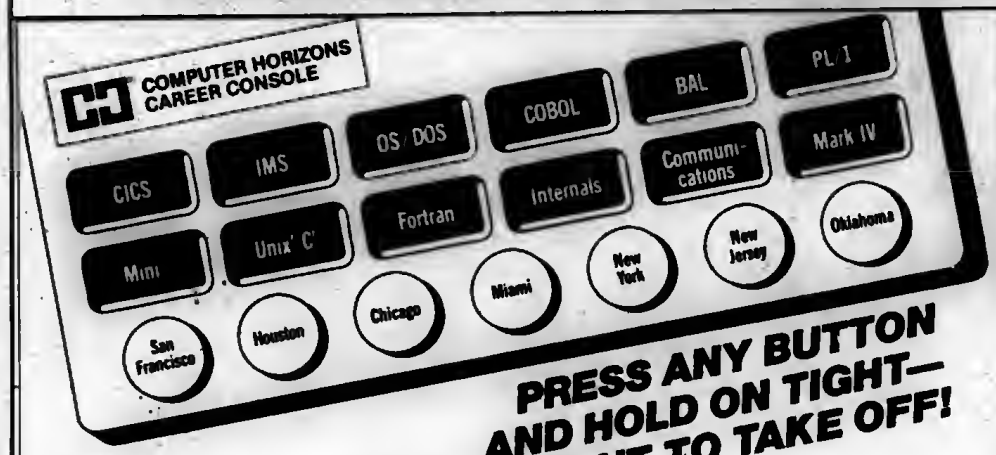

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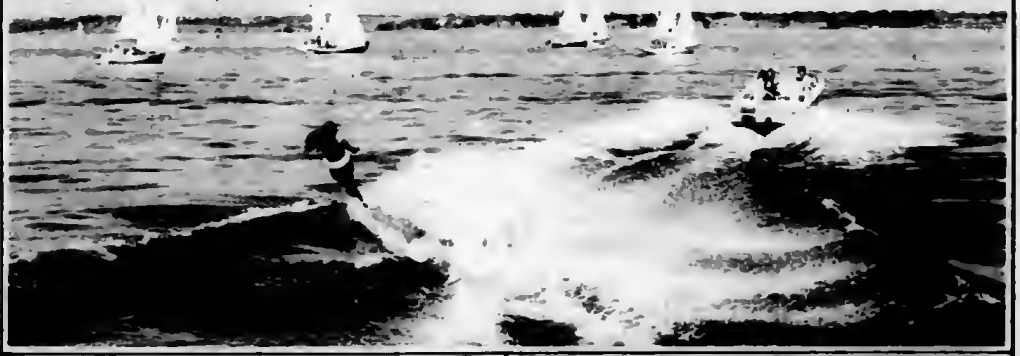

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Cost: Our rates are $54.70 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $109.40 per insertion. Extra space is available in half-inch increments and costs $42.35. Box numbers are $10.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us), WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____ Title: _____

Address: _____

_____

Telephone: _____

Send this form to:
CLASSIFIED ADVERTISING, COMPUTERWORLD
375 Cochituate Road, Box 880, Framingham, MA 01701

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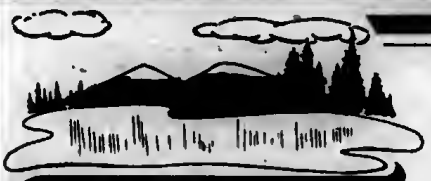

JOIN Hewlett-Packard AT OUR NEW LAKE STEVENS INSTRUMENT DIVISION

The Lake Stevens Instrument Division of Hewlett-Packard develops and manufactures state-of-the-art measurement instrumentation in the fields of signal generation and analysis.

We have positions open for **PROGRAMMER/ANALYSTS** in our manufacturing applications systems group. Design and development efforts will bridge the ground between production process control and production business planning and control.

BS degree in CS or IS or equivalent related experience is required. Familiarity with the following is desirable:

- COBOL, PASCAL, FORTRAN
- DATA BASE MANAGEMENT SYSTEMS
- STRUCTURED, DOCUMENTED PROGRAMMING METHODS
- HP 1000 OR HP 3000 OPERATING SYSTEMS

Lake Stevens is located on Puget Sound, 25 miles north of Seattle, Washington. Within a 50-mile radius of the plant site you can enjoy quiet rural greenery, urban cultural events, walks along the seashore or backpacking in your choice of two spectacular mountain ranges.

We offer you:

- A challenging professional career with a leading electronics company
- Participation in the start-up of a new division
- Opportunity to contribute to the development of state-of-the-art manufacturing and business applications

If you would like to spend your future with an exciting fast growing electronic company, send your resume to **Hewlett-Packard Company, Personnel Services, Department 317, P.O. Box 301, Loveland, Colorado 80537.**

HEWLETT PACKARD

An Equal Opportunity Employer Dedicated to Affirmative Action

MVS Systems Programmers:

Now there's an extra reason for making a career switch...

...the Datsun Referral Premium.

We're always on the lookout for outstanding data processing talent. That's why we offer our employees a special premium for referring experienced people to us. For a limited time we'll extend that offer directly to you. Just contact our Nissan representative and recommend yourself! If you're the qualified candidate we seek, we'll add our premium to our exceptional array of benefits when you join our growing MVS operation.

At Datsun, you'll have the opportunity to broaden your scope by working in all areas of the operating systems environment and teleprocessing.

If you are an MVS Systems Programmer with 2 years' experience, let us hear from you. We'll tell you more about our data processing environment and this unique opportunity to share the referral premium.

Please call our TOLL FREE number 7 days per week, 24 hours per day:
(800) 821-7700, Ext. 645
(800) 892-7655, Ext. 645 in MO
or send your resume to:

NISSAN MOTOR CORPORATION
P.O. Box 191-HM
Gardena, CA 90247

An Equal Opportunity Employer M/F

DATSUN

VICE PRESIDENT

SYSTEMS DEVELOPMENT

Prestigious Colorado financial institution offers highly visible and challenging growth opportunity. This position requires someone with excellent managerial skills, a strong profit orientation, and a previous track record of continuing advancement.

Other requirements include:

- Proven ability to deal with Sr. Management
- Experience managing a systems development function in a large scale IBM environment
- Decisive, action oriented personality with a desire to be measured.
- MBA degree or the equivalent experience.

Excellent compensation commensurate with experience good potential for future growth. We are consultants to management. For immediate and confidential consideration, please send your resume including salary history to:

Executive Consultant, Dept. C-0817
P.O. Box 2236, San Francisco, CA 94126

Employer retained

Programmer Cobol

Immediate Openings-N. California
"Come To Where The Action Is"

HP3000/COBOL
+ San Jose, 3 positions — To 35K
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+ S.F.

COBOL, IBM 303X/OS
+ East Bay Area
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RPGII, SYS-3/15D
CCP, +34, +SJ, +38 — To 30K

SYSTEMS PROGRS.
+ San Jose, Mid-Penin., 4 pos.
+ DOS VSE, 4341 — To 40K
+ 3033, 370/Os, MVS — To 40K

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DBA, EDP Auditors, Operators

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1901 S. Bascom # 1175
Campbell, CA 95008

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PROG/A	PL 1 OR COBOL		30K
SR PROG	RPG		29K
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PROG	COBOL		23K
PROG/OP	COBOL OR RPG		22K
SYS/ANAL	FINANCIAL APPL		35K
PROG/A	COBOL/MFG		28K
PROG/A	INSURANCE		32K
SYS/ANAL	Fortran/Graphics		36K
PROG/MGR	SYS34/MAPICS		30K

ROBERT HALF OF LOUISIANA, INC.
4630 One Shell Square
New Orleans, LA. 70139
(504) 524-5773

Professionals are Discovering FPS

Floating Point Systems, Inc. is a company built on accomplishment. Our people and our products have a single common denominator—excellence.

We are looking for qualified professionals ready for a challenge and a change. Consider a company with a reputation for excellence, and the unequalled natural beauty of the Pacific Northwest. The following key positions exist at our headquarters in Portland, Oregon.

MSQ Manager

You would manage our software configuration and Quality Assurance section. This position requires management experience plus data base techniques, software development methodology, programming standards, and Quality Assurance experience.

Product Marketing Specialists

Responsibilities include development of software support policies and strategies, planning and scheduling of software projects, promotional material, and support to field sales force. Strong scientific software development background required with experience in sales, marketing or applications a plus.

Software Development Engineer

You will develop, implement and maintain interfaces to operating systems which support existing and new products.

The ideal candidate should have a degree in Computer Science or Software Engineering. Knowledge of VAX(VMS) or IBM(CMS) operating systems, experience writing device drivers or channel programming, structured design techniques also desirable. FORTRAN and Assembly languages required.

For immediate consideration, send your resume and salary history to **Don McGee, P.O. Box 23489-CW09, Portland, OR 97223.** We are an equal opportunity employer.

FPS FLOATING POINT SYSTEMS, INC.

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OUTSTANDING COMPUTER CAREERS... AT NO COST TO YOU!

J.P. INTERNATIONAL is the computer career specialist who offers you a wide selection of the prized positions in the industry, and all fee paid. Our success record is unchallenged in this area, thanks to our outstanding file of major and respected clients. If you have 7 years or less EDP experience call us collect at (305) 941-0205 or submit confidential resume to:

J. P. International, Inc.

920 N. Federal Hwy., Suite 234
Pompano Beach, FL 33062

We Have Openings For Executive Recruiters

Seeking applicants for the following position for a utility in central North Dakota:

PROGRAMMER II

Excellent salary and fringe benefits. Call (701) 223-0441 or send resume in confidence to:

BASIC ELECTRIC POWER COOPERATIVE
Personnel Division
1717 East Interstate Ave.
Bismarck, N. D. 58501

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MOVE SOUTH NOW!

Don't wait another winter! We work with over 3,000 sunbelt companies. Our computer will match your skills to their needs. Client companies pay all fees. Send resume to: Data Processing Dept.

LANDRUM
PERSONNEL ASSOCIATES
P.O. Box 1373C
Pensacola, Florida 32596
CALL TOLL FREE (800) 874-3407

CHALLENGING CAREER OPPORTUNITY IN OPERATING SYSTEM SOFTWARE SUPPORT

Los Alamos National Laboratory is seeking an operating system software specialist to participate in improving our system's service to users. The incumbent will:

- provide software consulting for hardware engineers, computer operations, and consultants
- design and implement new capabilities
- analyze failures
- correct bugs
- document and perform other routine housekeeping functions.

QUALIFICATIONS:

- B.S. in computer science or closely related field or equivalent
- demonstrated professional-level experience in LTSS or CTSS operating system development and maintainence desirable
- experience with other operating systems will be evaluated as to its applicability to this position.

The laboratory is a multi-faceted national R & D organization operated by the University of California for the Department of Energy. We provide excellent working conditions and benefits such as 24 days' annual vacation. Our location in the mountains of northern New Mexico offers a pleasing lifestyle in a setting of great natural beauty: a pollution-free environment; ample recreational activities; casual, uncrowded living; an outstanding school system; and low taxes.

Send complete resume, in confidence, to:

Charles Mikkelson
DIV 81-CA
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Los Alamos

Data Processing

Data Processing Manager

Our 282-bed JCAH General Hospital is seeking an individual for Data Processing Manager. This is a ground-floor opportunity at Wyomings' largest hospital located in Casper to develop S/3 model 15D to full capacity during the next 3 years with plans to upgrade to S/38 in the future. A background in health care plus management experience is required. Will be responsible for a staff of 9 and will report to the Director of Finance. Annual salary is $25,000 plus.

Casper has a population of 60,000 and is centrally located in the Rocky Mountain area with year around recreation.

Please send resume to: Betty Snyder, Personnel Office, Memorial Hospital of Natrona County, 1233 E. 2nd Street, Casper, WY 82601. (307) 577-2406. We are an Equal Opportunity Employer.

MEMORIAL HOSPITAL OF NATRONA COUNTY

GICS DALLAS

MUMPS

to $31,000

Major prestigious West Coast medical center has opening for a Laboratory Programmer/Analyst to participate in implementing a Medical Laboratory Computing System. Experience in MUMPS, BASIC, or other Real-Time Interactive or Data Base Management languages desirable. Needs ability to interact with Scientific, Technical and Professional Users in a small team environment. Superior benefit and Professional Users in a small team environment. Superior benefit package and growth opportunity. Send resume, or contact:

Mr. John Gilbert
WESTERN HEALTH RESOURCES
PO Box 48919
Los Angeles, Cal. 90048
(213) 658-5520

Pioneer Western Corporation
P.O. Box 5068
Clearwater, FL 33518
Systems Analysts/Programmers

For an expanding financial services organization seeking analysts to do design and implementation work associated with the life insurance and oil and gas industry, as well as other business and financial applications. Programmers will have both maintenance and development responsibilities. This is a state-of-the-art environment utilizing an IBM 4341 and operating under DOS/VSE. Cobol is the primary language. Unique work week and outstanding benefits. Send resume and salary history to Personnel.

An Equal Opportunity Employer

Analyst Programmer I

Salary negotiable to $17,763/annum. The City of Largo, FL has an Analyst Programmer opening. Minimum of one year experience in systems design and programming on mini-computers is required. DIBOL or COBOL experience an asset. Degree in Business or Public Admin. desired.

Apply to:
City of Largo, Personnel Dept., PO Box 296, Largo, FL 33540 by 8/24/81

Equal Opportunity Employer

COBOL Programmer

We have an interesting position for a highly capable Senior Programmer to develop and maintain COBOL programs for our Honeywell Level 64 using GCOS. This position requires three-five years experience preferably with a manufacturing background. Wide variety of applications including on-line. Elden Industries is a rapidly growing multi-division corporation which can offer an exciting career plus excellent salary and benefits package. Please send resume and salary history to or contact:

Casey Stenerce
Elden Industries, Inc.
2701 West El Segundo Blvd.
Hawthorne, CA 90250
(213) 757-2161

We are seeking to fill

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You'll find little evidence of recession in the computer careers market in the San Francisco Bay Area. Growth continues at a rapid and steady pace with heavy demand at all levels for qualified EDP personnel. Our client companies pay all fees, interview and relocation expenses.

The Computer Resources Group, Inc., is a long-established (9 years), highly respected (150 leading companies utilize our services), and alert organization (our data bank of computer professional needs is unmatched in the San Francisco area).

Send your resume today to call collect.

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(415) 398-3535 or 3333 Bowers Avenue, Suite 130
Santa Clara, CA 95051 (408) 727-1658
AFFILIATES IN 27 MAJOR U.S. CITIES

COMPUTER RESOURCES GROUP INC

An employer-retained professional placement service

Data Base Analyst/ Systems Analyst
$20 - $28K
Florida

Degree plus three years COBOL in either a TP/DMS-1100 or CICS environment. Good communication skills are required. Positions are with a small consultant firm that can offer a variety of hardware and software exposure-cross training likely. Send resume to:

Advanced Systems Design Inc.
PO Box 12000
Tallahassee, FL 32000

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If you are interested in advertising with Computerworld, but don't know how to do it, give us a call! We'll be glad to send you our current rate card, which explains sizes, costs, deadlines and requirements. Along with that, we'll send a demo paper which actually shows examples of ad sizes, typefaces, and prices. Our toll free number is 800-343-6474, in Massachusetts call 879-0700, just ask for Classified Advertising. Or, you can look for our classified order form located in the classified section of Computerworld. Fill it out, attach your ad with a check, and return it to us. We're at 375 Cochituate Rd., Box 880, Framingham, MA 01701. Send attn: Classified Advertising. We're anxious to help!

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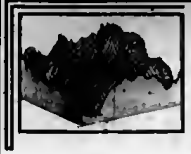
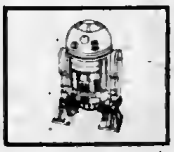


Systems Analysts

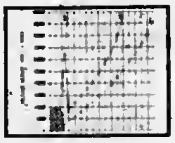
Use Your Technical Background in the Dymanic Field of Computer Graphics!



If you're an individual seeking to combine your technical background with your interpersonal skills, look no further. The industry standard in computer graphics currently has opportunities as Systems Analysts throughout the country.

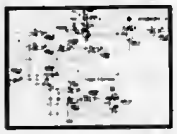
In a technical sales and customer support role, we offer:

- Expertise in computer graphics
- Involvement with broad applications
- Heavy customer interfacing
- A consulting role



To qualify, you will possess:

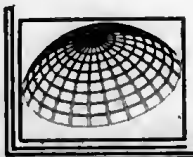
- BSCS or equivalent experience
- FORTRAN programming knowledge
- Excellent communications skills
- Timesharing and data communications experience.



Opportunities are available in:

Boston, MA
Rockville, MD
Philadelphia, PA
Orlando, FL
Atlanta, GA

Contact J. DeRolph at TEKTRONIX, INC., 2 Research Court, Rockville, MD 20850. (301) 948-7151. An Equal Opportunity Employer M/F/H.



Tektronix
COMMITTED TO EXCELLENCE

Careers in the Pacific Northwest

Washington Public Power Supply System is working on the Pacific Northewest's energy-producing project of the decade. We intend to bring five nuclear power plants on line within the next ten years.

Our work on this project has created immediate openings in our Richland headquarters for the following data processing positions.

Systems Analyst

In this lead position, you will define user information needs through continual interface with personnel in the business function. You will be guiding the program development effort and testing the final product. Some coding may be required. Ability to produce reports via a high level generator is necessary. A minimum of five years' data processing experience is required.

Programmer/Analyst

Your responsibilities will include working closely with systems analysts in designing program structure and coding application programs in COBOL or higher level languages. You will be using interactive CRT terminals to develop on-line DBMS-based application systems. A minimum of two years' programming experience in required.

We invite you to explore the career opportunities we can offer. For more information, please call our

Data Processing Manager
COLLECT at (509) 372-5483

or send your resume with salary history to:

Ms. Mary Ann Galbraith, Dept. MGJ408
Washington Public Power Supply System
P.O. Box 968
Richland, WA 99352

The Supply System is an affirmative action employer.

WASHINGTON PUBLIC POWER
SUPPLY SYSTEM

PROGRAMMER ANALYSTS

If You Are The Best, Why Not Work With The Best?

M.I.S. International is in its 12th year of providing systems and application expertise to Fortune 500 companies. Exciting software opportunities are available NOW with the Corporate Office staff, as well as our regional offices in Cleveland, and Chicago for.

- Commercial Programmer/Analyst with two or more years experience in either IBM COBOL, PL/1 . . . Honeywell 6000/MULTICS, IDS or Univac/Burroughs large systems, DMS, GMICOS.
- TSS/DB-DC, CICS/DL-1, IDMS . . . Applications experience required. Fine'l systems manufacturing control systems.
- Real Time programming experience in mini-micro computers and process control applications.

M.I.S. provides job security, top-of-the-line salaries, individual merit increases, full benefit program and relocation costs. Call Jim Schweizer at our Corporate Headquarters, 1-800-521-2144, or send your resume in confidence to:

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Corporate Headquarters
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Southfield, MI 48075
(313) 552-0550
Regional office: 24300 Chagrin Blvd., Beachwood, OH 44122 (216) 464-8989.
Equal Opportunity Employer

MIS INTERNATIONAL INC.

OPERATING SYSTEM AND ACADEMIC SUPPORT PROGRAMMER

Oberlin College wishes to hire a person to be responsible for maintaining and enhancing its computer operating system (CP-V) and system utilities. This person will also aid the Academic Support Group's consulting, training, and service efforts. Training will be provided. Requirements include a college degree, good oral and written communication skills, two years experience with operating systems programming in an assembly language, and knowledge of FORTRAN and other high level languages. The salary will be commensurate with experience and qualifications.

Send resume to:
Kevin Weidenbaum
Director of Academic Support Services
Houck Computing Center
Oberlin College
Oberlin, Ohio 44074

The final date for receipt of applications will be September 30, 1981.

Oberlin College is an Equal Opportunity Employer

DALLAS
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Excellent opportunity to work in stable industry, among high peer group, in dynamic Dallas.

Assembly language exper. a plus. High 300's.

Suite 1109 Stemmons Tower W
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DATA PROCESSING CAREERS INC

Data Processing

The world's leading manufacturer of submergible pumps is offering the following Data Processing Opportunity.

SENIOR TECHNICAL SPECIALIST

Requirements: Minimum two years systems programming experience in DOS/VS or DOS/VSE. Ability to plan and coordinate necessary functions to ensure an efficient DOS/VSE operating system. Our current system includes 4341 CPU, 3370 FBA devices and other IBM support products.

We are a major operating unit of a Fortune 75 Company, offering an excellent compensation package.

Please send your resume and salary history in confidence to:

TRW Reda Pump Division
Personnel Department · C
P.O. Box 1181
Bartlesville, Oklahoma 74005

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TRW REDA PUMPS

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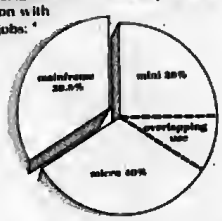
Take advantage of *InfoWorld's* nationwide circulation to reach the computer professionals you need now. *InfoWorld* is a biweekly newspaper directed to the microcomputing, personal-computer market. Readership surveys indicate that 80% of *InfoWorld* readers work professionally with all types of computer systems and software.

InfoWorld readers use these systems in conjunction with their jobs:*



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10% OFF•Mention this ad and get 10% off the first run of any size ad.

To Order space or to receive a complete media kit, call Laura Larson:

In California (415) 328-4602 Outside California call toll-free (800) 227-8365

*Based on the *InfoWorld* Readership survey, Fall 1980.

COMPUTERWORLD CLASSIFIEDS WORK!

- POSITION ANNOUNCEMENTS
- BUY SELL SWAP
- SOFTWARE
- TIME & SERVICES
- SOFTWARE FOR SALE
- REAL ESTATE
- BUSINESS OPPORTUNITIES

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or a camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (telecopier service is available): note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

Ad closing is every Friday, 6 working days prior to issue date.

Rates: Open rate is $84.70 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs $169.40 per insertion. Additional space is available in half-inch increments. Some sample sizes and costs are shown.

1 col x 4" — 338.80
2 cols x 4" — 677.60
2 cols x 5" — 847.00
2 cols x 8" — 1355.20

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available. $10 per insertion.
Ad Closing is every Friday, 6 working days prior to issue date (issues are dated Monday)

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617) 879-0700
New York - (201) 967-1350
Chicago - (312) 827-4433
San Francisco - (415) 421-7330
Los Angeles - (213) 450-7181
TELECOPIER SERVICE - (617) 879-0700

William J. Mills, Manager Classified Advertising

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

DATA PROCESSING PROFESSIONALS

Continued expansion of our dynamic Corporate Data Processing/Communications Group headquartered in Philadelphia, has led to the creation of new growth-oriented positions.

If you are open to 20 to 40% domestic and international travel, have a Bachelors in Business or equivalent experience, are well experienced in EDP and communications systems, and have the ability to deal effectively with all levels of personnel, then consider

COMMON SYSTEMS PROJECT LEADER
PAYING HIGH 30's to LOW 40's

Provide systems analysis and project management for the development, implementation and maintenance of application systems for use by multiple SmithKline operating areas. Five or more years experience in programming and analysis are required as is strong working knowledge of IBM 5/34 and RPG 11. Demonstrated knowledge of business and manufacturing (BOM) applications, and foreign language (French-Spanish) experience helpful.

Our compensation and benefits package including our relocation policy are geared to today's economy and are among the best in industry. Investigate your future and ours by sending your resume and salary history requirements in strict confidence to: JAMES SEYEA SmithKline Corporation, 1528 W. Spring Garden St., Philadelphia, PA 19101 Equal Opportunity Employer M/F/V/H

SmithKline
CORPORATION

DALLAS

APPLICATIONS	
CICS, DOS/VS, COBOL	$27,000
CICS DOS SUS. APPS	$29,000
DOS/VS, IDOS, IDMS	$26,000
SAS, OS, COBOL	$30,000
DOS/VS, CICS, DL-I	$27,000
DOS/COBOL	$22,000
APL	$30,000
CICS Business Applications	$28,000
SOFTWARE	
DOS/MVS/VM	$36,000
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MVS Internals	$36,000
Communications-IBM OS	$27,000
Univac 1100, Exec	$28,000
SAS Overseas	Open
OS Overseas	Open
Univac, DMS 1100	$36,000
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System 34 RPG II	$22,000
System 34 RPG II	$30,000
System 34 RPG II	Open
TI 990 Manager	$30,000
Data Point-Databus	$26,000
Data Point-Databus	$28,000
HP 3000-COBOL	$22,000

CONTACT: John Steiger
ROBERT HALF of DALLAS, INC. (214) 363-3300
Two NorthPark East, Suite #750
Dallas, Texas 75231

Data Processing

SENIOR PROGRAMMER-ANALYST OR SUPERVISOR

California Microwave, Inc., a leader in microwave communications has an opening for a hands-on professional to perform and supervise applications programming and systems development. Will work extensively with Users at all levels; responsible for machine operating system performance. Growth opportunity; small progressive D.P. shop where we can fit the job to you. Salary commensurate with experience.

- Dual DEC PDP11/70 Mini-computers
- Sophisticated on-line Integrated Mfg and Financial Systems
- Growing electronics company (over $80MM sales)
- BASIC language, RSTS/E V7.0 operating system

Required: College degree; 3 years' D.P. experience.

California Microwave offers an excellent benefit package to include Company paid insurance premium for employees, stock purchase plan, as well as flexible working hours. Stop by and apply or send your resume to: 990 Almanor Avenue, Sunnyvale, CA 94086. Equal Opportunity Employer. M/F/H.

CALIFORNIA MICROWAVE

DATA PROCESSING PROFESSIONALS

Don't let a lack of knowledge of the marketplace serve as an obstacle to your career development. Through our network of offices we can assist you in exploring new job opportunities and inform you on industry and salary trends. No obligation - just call or write Lynne Hall, Data Processing Specialist.

Dunhill
of CHARLOTTE INC
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28211
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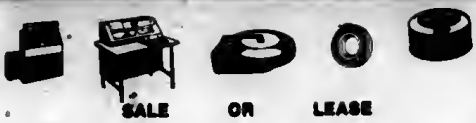

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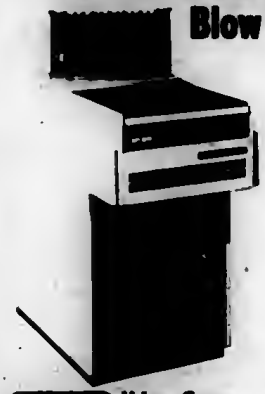

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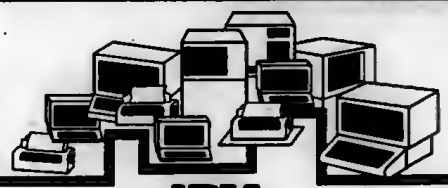

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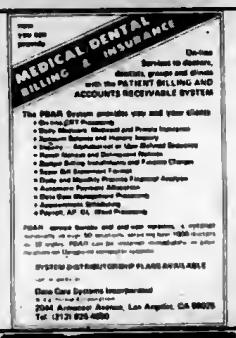

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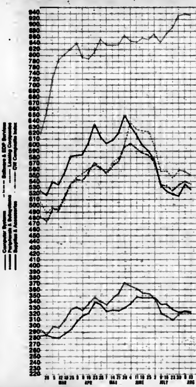

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 12, 1981

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1980-81 RANGE (1)	CLOSE AUG 12 1981	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	18- 45	34	-2	-5.8
B	BURROUGHS CORP	35- 98	35 1/4	- 1/8	-0.3
O	COMPUTER AUTOMATION	9- 27	12 1/2	- 1/4	-1.0
B	CONTROL DATA CORP	35- 98	73 1/2	- 7/8	-1.1
O	CRAY RESEARCH INC	19- 48	31 7/8	-2 3/8	-6.8
B	DATA GENERAL CORP	46- 87	35 3/4	-3 1/2	-8.8
B	DATAPOINT CORP	22- 98	84 1/4	0	0.0
B	DIGITAL EQUIPMENT	82-113	88	+ 8/8	+0.9
A	EECO INC	6- 18	12	+1 3/4	+17.0
B	ELECTRONIC ASSOC.	8- 12	7	0	0.0
B	FOUR-PHASE SYSTEMS	19- 48	38 1/8	+2 1/4	+0.8
B	FOXBORO	31- 62	48 7/8	+2 3/8	+5.0
O	GENERAL AUTOMATION	7- 18	12 3/8	+ 1/4	+2.0
O	DBI COMPUTER CORP	1- 3	1 1/4	0	0.0
B	HARRIS CORP	25- 80	48 1/2	- 3/4	-1.0
B	HEWLETT-PACKARD CO	22- 34	48 1/4	0	0.0
B	HONEYWELL INC	65-113	98 1/2	- 3/4	-0.8
B	IBM	39- 79	57 7/8	- 1/2	-0.8
O	MAGNUSON COMP SYSTS	16- 48	18 3/4	-1	-9.0
N	MANAGEMENT ASSIST	9- 25	13 1/8	-1	-7.0
O	BIAI-COMPUTER SYS7	1- 8	1 3/4	0	0.0
N	MODULAR COMPUTER SYS	9- 31	8 3/4	-1 3/8	-12.3
B	MOHAWK DATA SCI	10- 31	17	- 8/8	-3.8
B	NCR	52- 82	67 7/8	- 8/8	-1.0
B	PRIME COMPUTER INC	19- 49	23 3/4	-4 8/8	-10.2
B	PERKIN-ELMER	13- 35	25 1/8	- 1/2	-1.8
B	SPERRY CORP	40- 85	41 1/4	- 8/8	-1.4
O	TANDEM COMPUTERS INC	10- 35	31 1/2	+ 1/2	+1.8
N	TEXAS INSTRUMENTS	78-150	85 1/2	-1 1/8	-1.1
A	WANG LABS.	17- 80	28 7/8	-1 1/8	-3.8

LEASING COMPANIES

EXCH		1980-81 RANGE (1)	CLOSE AUG 12 1981	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	13- 27	27	+1	+3.8
B	COMDISCO INC	8- 24	20 1/4	-1 1/2	-6.8
A	COMMERCE GROUP CORP	1- 2	1 1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 4	8/8	0	0.0
O	CONTINENTAL INFO SYS	2- 13	8	+ 1/2	+6.8
A	DCL INC	3- 8	3 8/8	0	0.0
B	GPF INC	8- 12	8 8/8	- 1/8	-1.2
O	ITEL	1- 13	7/8	0	0.0
O	LEASPAC CORP	1- 2	3/8	0	0.0
A	PIONEER TEX CORP	2- 8	3 1/8	- 3/8	-8.8
B	RELIANCE GROUP INC	24- 98	80 1/4	+ 1/2	+0.8
B	U.S. LEASING	12- 30	22 3/8	+ 3/8	+1.7

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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SOFTWARE & EDP SERVICES

EXCH		1980-81 RANGE (1)	CLOSE AUG 12 1981	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED CORP TECH	1- 8	8 3/4	+ 3/8	+8.8
O	ADVANCED SYSTEMS INC	10- 15	10 3/4	+ 1/2	+4.8
O	ANACOMP INC	9- 18	18 3/8	+1 1/2	+8.8
O	ANALYSTS INTL CORP	8- 14	8	0	0.0
A	APPLIED DATA RES.	9- 25	18	+ 1/4	+1.4
N	AUTOMATIC DATA PROC	15- 32	28 3/8	+1 1/8	+3.8
O	CDA COMPUTER RESOC	7- 17	7 3/4	+1	+14.8
O	COMPUTER HORIZONS	1- 8	3	0	0.0
O	COMPUTER NETWORK	9- 8	8	+ 1/8	+2.8
B	COMPUTER SCIENCES	11- 38	17	- 8/8	-3.8
O	COMPUTER TASK GROUP	1- 23	18 1/4	0	0.0
O	COMPUTER USAGE	2- 18	3 1/4	- 1/2	-13.3
O	COMSHARE	11- 21	11 3/4	- 1/4	-3.0
O	CULLINANE DATABASE	18- 98	54 1/2	-1 1/2	-2.8
O	DATA DIMENSIONS INC	1- 8	1 1/8	- 1/4	-18.1
O	DATATAB	1- 4	3 1/2	- 3/8	-13.0
O	DSI CORP	9- 8	8 1/4	+ 3/8	+0.3
O	SYATRON CORP	6- 11	8 3/4	- 1/4	-4.1
N	ELECTRONIC DATA SYST	19- 30	28 1/2	-1 1/2	-8.3
O	INFORMATICS INC	8- 33	22 1/4	- 1/4	-1.1
O	INSYTE CORP	1- 3	2 1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 4	1 3/4	0	0.0
O	KEANE ASSOCIATES	3- 8	8 1/2	0	0.0
A	LOGICON	12- 38	31 3/8	+1 8/8	+5.4
O	MGMT SCI AMER INC	17- 28	20 3/4	+2	+10.8
O	MATHEMATICA INC	8- 18	18	+ 1/4	+1.8
O	MATHEMATICAL APP GRP	7- 33	18 3/4	- 1/4	-1.2
O	NATIONAL DATA CORP	8- 27	18 1/2	- 7/8	-4.2
B	PLANNING RESEARCH	8- 13	8 8/8	+ 1/8	+1.8
O	PROGRAMMING & SYS	1- 3	1 3/4	- 1/8	-8.8
O	RAPIDATA INC	8- 11	7	- 1/3	-8.0
O	REYNOLDS & REYNOLD	19- 34	20 3/4	-1	-0.8
O	STSC INC	8- 28	13 1/2	-2	-12.8
O	SCIENTIFIC COMPUTERS	8- 17	8	0	0.0
O	SOFTWARE AG	17- 23	18 1/4	-1	-8.1
N	TYMSHARE INC	17- 38	34	-1 1/4	-3.5
A	URS CORP	9- 17	13 3/4	- 3/8	-2.8
B	WYLY CORP	8- 20	10 1/8	- 1/2	-4.7

PERIPHERALS & SUBSYSTEMS

EXCH		1980-81 RANGE (1)	CLOSE AUG 12 1981	WEEK NET CHNGE	WEEK PCT CHNGE
B	AM INTERNATIONAL	11- 24	12 1/8	- 1/2	-3.8
A	ANDERSON JACOBSON	8- 28	18 1/8	+ 3/8	+2.1
O	AUTO-TROL TECHNOLOGY	13- 62	13 1/2	+ 1/4	+1.8
O	BEEHIVE INT'L	2- 18	11 1/4	- 1/4	-2.1
A	BOLT,BERANEK & NEW	8- 25	18 3/8	0	0.0
B	BUNKER RAMO	17- 36	34	0	0.0
C	CAMBEX CORP	1- 8	4 3/4	- 3/8	-7.3
N	CENTRONICS DATA CORP	10- 35	18 1/4	- 1/8	-1.2
A	CETEC CORP	8- 8	9 1/8	- 1/2	-8.8
O	COMPUTER DEVICES INC	8- 10	7	- 1/4	-3.4
O	COGNITRONICS	1- 11	8 3/8	+ 1/4	+3.0
O	COMPUTER COMMUN.	1- 18	2	- 1/8	-5.8
O	COMPUTER CONSOLES	9- 37	23 8/8	- 3/4	-3.0
O	COMPUTER TRANSCEIVER	1- 8	8 3/8	+ 8/8	+8.0
B	COMPUTERVISION CORP	13- 48	43 1/8	+ 3/8	+0.8
N	CONRAC CORP	13- 27	24 3/8	-1 1/4	-4.8
A	DATA ACCESS SYSTEMS	6- 28	8 1/8	+1 3/4	+23.7
A	DATAPRODUCTS CORP	11- 44	25 7/8	+ 8/8	+2.1
O	DATUM INC	3- 8	2 3/8	- 1/8	-4.0
O	DECISION DATA COMPUT	2- 8	8 7/8	- 1/8	-3.1
O	DELTA DATA SYSTEMS	1- 4	3 3/4	+ 3/4	+25.0
O	DATARAM CORP	8- 37	7 3/8	+ 1/8	+1.7
B	ELECTRONIC M & S	8- 8	4 8/8	+ 1/8	+2.7
O	EVANS & SUTHERLAND	7- 38	28 1/4	-1 1/4	-4.0
O	FABRI-TEK	1- 8	3 3/4	- 3/8	-8.8
O	GENERAL COMPUTER SYS	1- 12	8	+ 1/4	+3.2
O	GEN'L DATA COMM INC	8- 22	11 3/8	+ 1/8	+1.1
O	GENERAL TERMINAL CP	1- 4	1 3/8	0	0.0
N	HAZELTINE CORP	13- 33	23 1/4	-1 1/4	-4.7
O	INFORMATION INTL INC	8- 17	13 1/2	+ 1/3	+3.8
O	INTEL CORP	23- 38	31	-1 1/3	-4.8
O	IPL SYSTEMS INC	10- 18	10 1/2	- 1/4	-2.3
A	LUNDY ELECTRONICS	8- 17	12 1/4	-1	-7.8
O	MSI DATA CORP	9- 27	18 3/4	+ 3/4	+4.1
N	MEMOREX	9- 34	12 3/8	- 5/8	-4.8
O	NETWORK SYSTEMS CORP	18- 28	20 1/8	- 3/8	-1.8
O	OMEX	3- 12	12	0	0.0
A	PARADYNE CORP	9- 38	43 1/4	0	0.0
A	PENRIL CORP	8- 17	13 1/8	- 1/2	-3.8
O	RAMTEK CORP	10- 28	13 5/8	+ 3/8	+2.8
O	RECOGNITION EQUIP	9- 31	11 1/2	+ 3/8	+3.3
O	SCAN DATA	1- 9	2	0	0.0
B	STORAGE TECHNOLOGY	13- 35	32 1/8	+ 7/8	+2.7
O	SYKES DATATRONICS	9- 25	21 1/4	-1	-4.A
O	T BAR INC	13- 24	18 1/2	+ 8/8	+8.3
A	TEC INC	8- 9	8	+ 3/8	+0.8
B	TEKTRONIX INC	42- 70	53 1/4	-1 1/2	-2.7
B	TELEX	8- 8	8 1/2	- 3/8	-5.A
O	TESDATA SYSTEMS CP	9- 38	8 1/8	- 1/4	-2.8
A	TIMEPLEX INC	9- 22	11 1/4	0	0.0
O	WILTEK INC	1- 3	1 3/4	- 1/8	-6.8

SUPPLIES & ACCESSORIES

EXCH		1980-81 RANGE (1)	CLOSE AUG 12 1981	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	9- 17	13 3/8	- 1/8	-0.8
O	BALTIMORE BUS FORMS	1- 2	1 1/8	0	0.0
B	BARRY WRIGHT	9- 23	18 3/4	- 1/8	-0.8
O	CYBERMATICS INC	1- 2	1 1/8	0	0.0
A	DUPLEX PRODUCTS INC	11- 18	14 3/8	+ 1/8	+0.8
B	ENNIS BUS. FORMS	13- 22	18 3/4	- 1/2	-2.4
B	3M COMPANY	48- 68	83 8/8	+ 3/8	+0.7
O	MOORE CORP LTD	27- 38	32 1/4	+ 1/4	+0.7
B	NASHUA CORP	18- 38	20	+ 8/8	+3.2
O	STANDARD REGISTER	22- 38	38	-1 3/4	-4.8
A	TAB PRODUCTS CO	9- 30	20 8/8	- 8/8	-2.8
B	WALLACE BUS FORMS	12- 31	28 7/8	- 1/8	-0.4

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